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ABSTRACT

This document represents the first efforts of the Hawaii State Occupational Information Coordinating Committee (HSOICC) to define the basic concepts of the Hawaii Occupational Information System (HOIS). It provides the basis on which Hawaii can build in subsequent years, and can be used in two ways: to provide ideas and material to be used in structuring HOIS-related training for target audiences: and to develop an action plan for the HOIS implementation in Hawaii. The document consists of five volumes. The first four volumes focus on occupational information development. They contain descriptive detail on the reporting systems, survey programs, and other data collection efforts that provide the information necessary for the HOIS. The fifth volume, the HOIS Handbook, presents a process and techniques for the analysis, presentation, and delivery of occupational information. (KC)

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THE HAWAII OCCUPATIONAL INFORMATION SYSTEM

--A Plan
--A Technical Manual
--A Handbook

HSOICC
HAWAII STATE OCCUPATIONAL INFORMATION COORDINATING COMMITTEE

CE 028 941

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
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HAWAII STATE OCCUPATIONAL INFORMATION COORDINATING COMMITTEE

The Vocational Education Amendments of 1976 (Public Law 94-482) and the Comprehensive Employment and Training Act as amended by the Youth Employment and Demonstration Projects Act of 1977 (Public Law 95-93) call for the establishment of State Occupational Information Coordinating Committees (SOICCs) as well as a National Occupational Information Coordinating Committee (NOICC). As a result of the legislation and pursuant to an agreement with the NOICC, the State of Hawaii has officially established an organization known as the Hawaii State Occupational Information Coordinating Committee (HSOICC). An interagency agreement between the State Board for Vocational Education; DLIR; DSSH, Division of Vocational Rehabilitation, and the State Manpower Services Council (DLIR, Office of Manpower Planning) has been agreed to with NOICC and signed as the principal agents of HSOICC.

The major role for HSOICC is to increase the awareness of occupational information availability; provide a forum for the interaction between planners, counselors, CETA Prime Sponsors, Employment Services offices, and others interested in occupational data needs and uses; to standardize terminology and definitions across the occupational data system of the various state and local organizations and agencies; to eliminate duplicative occupational data efforts and fill data gaps; and to develop and implement a coordinated Hawaii Occupational Information System which can be readily accessible to users, including consumers, trainers, counselors, and curriculum planners; and to provide training in the use of occupational data.

Governor George R. Ariyoshi
State of Hawaii

HAWAII STATE OCCUPATIONAL INFORMATION COORDINATING COMMITTEE

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HSOICC
Executive Advisory Committee

PREFACE

This document represents the first efforts of the Hawaii State Occupational Information Coordinating Committee (HSOICC) to define the basic concepts of the Hawaii Occupational Information System (HOIS). This document is not intended to provide a comprehensive description of the HOIS, nor is it intended to be considered as the final draft of a procedural manual for HOIS development and implementation. Instead, the minimum parameters of the HOIS are outlined. These parameters provide the basis or core on which Hawaii can build in subsequent years.

HSOICC's role is to help define the basic informational requirements and standards that an HOIS must satisfy. HSOICC will help determine and implement an appropriate HOIS operational process for satisfying these requirements and standards. Throughout this document there will be suggestions and recommendations to be considered in coordinating the development of the HOIS. This document can be used in two ways:

> First, the document provides ideas and material to be utilized in structuring HOIS-related training for target audiences.
>
> Second, the document helps develop an Action Plan for the HOIS implementation in Hawaii.

This document is the culmination of the efforts of many people. These efforts are appreciated by HSOICC and we would like to take this opportunity to express our gratitude to NOICC for its assistance in developing the document's conceptual and structural bases.

THE HAWAII OCCUPATIONAL INFORMATION SYSTEM

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VOLUME I

THE HAWAII OCCUPATIONAL INFORMATION SYSTEM

VOLUME I:
The Hawaii Occupational Information System Framework

HSOICC

HAWAII STATE OCCUPATIONAL INFORMATION COORDINATING COMMITTEE

THE HAWAII OCCUPATIONAL INFORMATION SYSTEM
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I. INTRODUCTION

The notion of constructing a formal and standardized system for the collection, analysis, and dissemination of occupational information is relatively new. Several pieces of legislation have referenced or mandated the development and use of an Hawaii Occupational Information System (HOIS). However, to date, a detailed explanation of the structure and content of the HOIS has been lacking. To provide leadership in the development and implementation of the HOIS, Congress has mandated the establishment of the National Occupational Information Coordinating Committee (NOICC) and the Hawaii State Occupational Information Coordinating Committee (HSOICC). Since that initial legislative mandate was established, the OIS has been discussed in other legislative acts. This chapter provides background information on how specific legislation led to the formulation of OIS development strategy and policies. Also, a discussion shows how the strategy and policies translate into operational tactics. Finally, the chapter concludes with a brief overview of the contents and structure of the remainder of this document.

1. LEGISLATIVE BACKGROUND

The establishment of HSOICC (and the NOICC) was mandated by the Education Amendments of 1976, P.L. 94-482, Title II, Vocational Education, Section 161(b)(1) and (b)(2). Section 161(b)(1) states that a primary purpose of NOICC shall be:

> To develop and implement an occupational information system to meet the common occupational information needs of vocational education programs and employment and training programs at the national, State, and local levels, which system shall include data on occupational demand and supply based on uniform definitions, standardized estimating procedures, and standardized occupational classifications.

Although this section of the law clearly indicates that an OIS should serve the occupational information needs of vocational education and employment and training programs, the specific information needs are never identified. Moreover, the dimensions of the system, in relation to occupational supply and demand information, are only defined in general terms such as "uniform definitions" and "standardized estimating procedures." Clearly, a more specific structure is necessary if the OIS is to become a reality.

Three other subsequent legislative acts make reference to the concept of an OIS. In each of these pieces of legislation, the OIS is referred to in broad, sweeping terms. Highlights of these legislative acts are summarized below. In each of the summaries, the specific references to the OIS or to NOICC are noted.

- Youth Employment and Demonstration Projects Act (YEDPA) of 1977 (P.L. 95-93)--Section 348(c)(1) of the YEDPA legislation states that . . .

  "In carrying out its responsibilities under this subsection and under section 161 of the Vocational Education Act, the National Occupational Information Coordinating Committee shall give special attention to the problems of unemployed youths."

  In subsections (B) and (D), the act provides examples of OIS-related activities that NOICC should be conducting in the spirit of this legislation. These include:

  --"(B) asserting and encouraging the development of state occupational information systems, to be used in the maintenance of local job banks and job vacancy reports, accessible to local schools and including pilot programs in the use of computers to facilitate such access."

  --"(D) providing technical assistance for programs of computer on-line terminals and other facilities to utilize and implement occupational and career outlook information and projections supplied by the state employment services offices and to improve the match of youth career desires with available and anticipated labor demand."

  Both of these activities suggest that the OIS will be a computer-based system that will provide job search and occupation/career related information to youths. This concept of the OIS is fundamentally different than the concept presented in the Education Amendments of 1976. The emphasis in that legislation was that the OIS would provide occupational information to meet the needs of vocational education and manpower training program planners and administrators. The YEDPA legislation maintains that emphasis but expands the functions that an OIS should serve.

.Career Education Incentive Act (P.L. 95-207)--In Section 12(a) of this legislation, the Commissioner of Education is charged with cooperating and consulting with NOICC in examining the "occupational information needs of individuals and organizations eligible for participation in programs assisted by this Act." The Act further instructs the Commissioner to ". . . furnish information to interested parties on Federal programs which gather, analyze and disseminate occupational and career information." These functions of analyzing and disseminating occupational and career information are strongly aligned with the principal purposes of the OIS. However, the target audience for these dissemination activities is different than the target audience identified in the Education Amendments which included:

--Administrators and planners of vocational education programs

--Administrators and planners of CETA programs

--Employment security agency administrators

--Research personnel

--Employment and training and administering agencies at the Federal, State, and local levels

By contrast, the target population associated with the Career Education Incentive Act includes local education agencies, institutions of postsecondary education, and students at both secondary and postsecondary institutions. Clearly, these additional target populations broaden the scope of the information requirements and user base that the OIS must serve. Again, legislation is responsible for broadening the OIS concept.

.Comprehensive Employment and Training Act (CETA) Reauthorization (P.L. 95-524)--The CETA Reauthorization legislation is very similar to the YEDPA legislation. In Section 315(a)(3), the Act states:

"The National Occupational Information Coordinating Committee, in carrying out its responsibilities under this section, shall give special attention to the labor market information needs of youth, including activities such as, but not limited to--

(3) assisting and encouraging the development of state occupational information systems, accessible to local schools, including pilot programs in the use of computers to facilitate such access."

Once again, legislation indicates that a computer-based OIS would be desirable particularly with regard to providing access in local schools to occupational and career information. This is further emphasized in the CETA legislation in the section of the Act that explains the potential uses of the Governor's discretionary funds. Section 105(b)(12) states:

"(b) Governor's coordination and special services activities shall include the following--

(12) facilitating and fostering the activities of the State Occupational Information Coordinating Committee established pursuant to Section 161(b)(2) of the Vocational Education Act of 1963, with special emphasis on the systematic use of occupational information for prime sponsor planning as well as assisting and encouraging the development and use of career outlook information for individuals who are receiving rehabilitation services, students in local schools, and individuals using the services of prime sponsors and local offices of state employment security agencies."

.State of Hawaii Legislation--The 1979 Session of the Hawaii State Legislature passed House Concurrent Resolution Number 49, "Requesting the Hawaii State Occupational Information Coordinating Committee (HSOICC) to Utilize an Advisory Committee Structure for the Purpose of Increasing the Input and Participation in the Information System."

"Whereas, the Hawaii State Occupational Information Coordinating Committee (HSOICC) has been established by federal legislation to coordinate the efforts of various agencies in vocational education, employment training, employment service, and vocational rehabilitation in developing a statewide occupational information system to meet the information and data needs of planners and guidance personnel in employment, vocational and related fields; and . . .

"Whereas, an effective statewide occupational information system requires that the information and other data be full and complete with input from all sources, both public and private, instead of being limited to the four agencies required by federal law; and

"Whereas, in addition to the benefits of a full and complete statewide occupational information system, all agencies and organizations would benefit by their participation in the development of a single comprehensive statewide occupational information system . . . ."

As the preceding discussion of the legislation indicates, the concept of an OIS is presented as serving a variety of users. The legislation specifies the purposes of the OIS and identifies the major user groups. However, the legislation does little to explain the specific information that is to be used and the manner in which the OIS is to be developed and implemented. Therefore, HSOICC had to devise a strategy to most effectively meet its mandate of developing and implementing the OIS.

2. HSOICC STRATEGY FOR OIS DEVELOPMENT

The OIS development process must be multi-faceted to meet the needs of various users and satisfy the legislative requirements described above. Of necessity, the development of an OIS will be a phased process with user's information needs being better satisfied as system capabilities and resources expand. At the same time that the OIS is being developed, the system must also be operational, providing reliable and relevant information to a variety of user groups at periodic intervals. This dual requirement, that the system be operational and developmental simultaneously, dictates that the OIS implementation plan consider two objectives, one directed towards urgent short-term operational considerations and the other towards long-term OIS development objectives.

A major factor in HSOICC strategy for OIS development and implementation was the establishment of national OIS policies. The policies are indicative of the role that is foreseen for HSOICC in the implementation of the OIS. These policies are:

- The HSOICC will not become a primary data collection agency. By implication, this means that the HSOICC will not initiate any major data collection efforts on their own. To the extent possible, programs that entail the collection of data will be operated through a member agency or other appropriate organization.

- Where possible, the HSOICC will use the existing programs and capabilities of member agencies in developing and implementing the OIS. Part of HSOICC's role in developing an OIS concept is to determine how information or data from these various programs can be integrated and systematically organized to effectively satisfy users' needs. This process can be accomplished through various methods as will be discussed later in this paper.

- HSOICC will take an active role in the delivery of OIS materials. This policy clearly delineates HSOICC's role as a disseminator of information. Further discussion of this function and other functions of the HSOICC relative to the OIS is discussed in Chapter IV.

HSOICC will coordinate among its member agencies the adoption of programs to serve as OIS standards and will continually encourage the development, improvement, and expansion of these programs to meet OIS needs. As OIS requirements are further identified, there are certain to be gaps and deficiencies in the data presently available. HSOICC will encourage its member agencies to improve and expand these programs to be more responsive to OIS requirements.

NOICC will assist HSOICC in OIS development by the funding of a series of developmental and implementation projects that are national in scope. These projects will be funded either through the normal competitive "Request for Proposal" (RFP) process or through competitive grant announcements to HSOICC. One such grant announcement covering the following four interrelated projects, will be released FY 1979.

(1) "An Assessment and Documentation of OIS Requirements by User Groups" --These assessments will be papers prepared by recognized experts and will focus on the specific occupational information needs of major OIS user groups. These papers will address such issues as timing requirements of information input and output, time frames of projections, amount of occupational detail, etc.

(2) "A Concept Paper on the Design of the Occupational Information System" --This paper will synthesize the information requirements presented in the needs assessment papers into a conceptual framework of a comprehensive OIS with a description of its form, content, and operations.

(3) "Occupational Information System Handbook"--The Handbook will be an operational document explaining how an OIS can be implemented. This Handbook will follow the basic structure established by the concept paper and will contain technical information describing each information/data service and its advantages and limitations. The Handbook will contain OIS terms, definitions, and classifications. The Handbook will be a multi-volume document presented in looseleaf binders to facilitate modifications and additions to the document.

(4) "OIS Orientation and Training Package"--This package will consist of a structured training program together with support materials. The package will be tailored to meet the training requirements of various user groups and the support materials will be designed to present OIS topics in differing degrees of detail. This package can be used for presentations, workshops, and as a source of OIS written materials.

3. CONTENTS OF THIS VOLUME

Following this introduction there are five chapters, each addressing a different aspect of the OIS. Chapter II presents an overview of the OIS concept and discusses reasons why an OIS is needed and problems that exist in developing an OIS. In addition, Chapter II identifies the various users that an OIS must serve, discusses the HSOICC organizational structure and its appropriateness for OIS development, and defines the OIS, including a discussion of the occupational, geographic, and time reference dimensions of the system. Finally, Chapter II introduces the components of an OIS in terms of the data categories and the analytical procedure that are part of the system's structure.

Chapter III further explains the structure of the OIS including an in-depth discussion of required data categories and sub-categories. Within each data sub-category, the relevant data sources and their respective limitations are identified. Complete descriptions of the data sources; occupational, industrial, and instructional classification structures; and cross-coding mechanisms, are included in Volume II: Appendices A, B, and C respectively. These descriptions amplify the material presented in Chapter III. An important aspect of this chapter is the discussion of the analytical procedure for interfacing occupational supply and demand data.

II. OVERVIEW OF THE OIS CONCEPT

The need for occupational information has grown dramatically over the last fifteen years. The successful delivery of services related to the development of human resources is critically dependent upon access to reliable, timely, and detailed information about occupations that can be systematized into an integrated, comprehensive network. Vocational educators, planners of Federally-funded education and training programs, persons responsible for assisting individuals to find jobs, trainers in industry, guidance counselors, and a variety of others have increasingly sought occupational information to carry out their respective functions and responsibilities. This chapter explores some of the historical background and problems associated with the development and utilization of reliable occupational data and then presents a conceptual definition of an OIS. The OIS will not duplicate services already in existence, but will identify and fulfill the unmet information and data requirements.

1. THE NEED FOR AN OCCUPATIONAL INFORMATION SYSTEM

There have been several inherent problems in the development and utilization of reliable occupational information for program planning and career counseling. From the perspective of vocational education and manpower training program administrators and planners, occupational data for planning purposes must be available with the proper geographic specificity and time period reference. Users have complained that data are provided in a hard-to-utilize format and that data are unavailable at the necessary points in their planning cycles. The problem is further compounded because decision makers are sometimes unaware of data that exist and unsure in the use of the data with which they are familiar. As a result, some training and education programs are not relevant to current or projected occupational demand within a labor market.

Administrators and planners are becoming increasingly aware of this problem and are beginning to use existing data and to request more and better data from data producers.

Data producers are being confronted with increasing demands for data and information. Limited by budget constraints and insufficient personnel resources, the data producers are experiencing difficulty in conducting programs or maintaining data collection systems that are responsive to the data and information needs of users. Data collection and analysis are time-consuming procedures and often require computer support, which may not be available. Data production is further complicated by the varying degrees of occupational specificity required by different users. In short, the development of reliable, timely occupational data is not a simple task.

2. USERS OF AN OCCUPATIONAL INFORMATION SYSTEM

The potential users of an OIS can be categorized in three ways:

(1) Direct participants in the labor market

(2) Labor market intermediaries, such as persons who assist others in preparing for the world of work

(3) Planners and administrators, such as persons who develop and implement job-related education and training programs

Exhibit 2-1, on the following page, provides further description of each user category and provides examples of the specific types of individuals in each user category.

The HSOICC organizational structure has been designed to establish a formal coordinating agent between agencies that are producers of occupational information and agencies, organizations, and individuals who us occupational information or data as part of their decision-making process. The success of HSOICC in fulfilling this coordinative role will in large measure be determined

EXHIBIT 2-1
OIS USERS

CATEGORIES	DIRECT PARTICIPANTS IN THE LABOR MARKET	LABOR MARKET INTERMEDIARIES	PLANNERS AND ADMINISTRATOR
USES	. Job search activities . Career decision making	. Career counceling . Job placement . Course development	. Program planning . Policy decisions
USERS	(1) Youths (2) Secondary and post-secondary students (3) Unemployed (4) Incarcerated (5) New entrants to the job market (6) Individuals who need information about career choices (7) Employers (8) Military returnees	(1) Teachers (2) Vocational counselors (3) Guidance counselors (4) Job placement specialists (5) Employment service	(1) Vocational education planners and administrators (2) CETA planners and administrators (3) Managers of human resource development programs (4) Policy decision makers

by how well the information needs of the various user groups are satisfied by an occupational information network.

3. HSOICC STRUCTURE AND ORGANIZATIONAL INTERRELATIONSHIPS

The Education Amendments of 1976 mandate the statutory members of HSOICC. The following agencies are included:

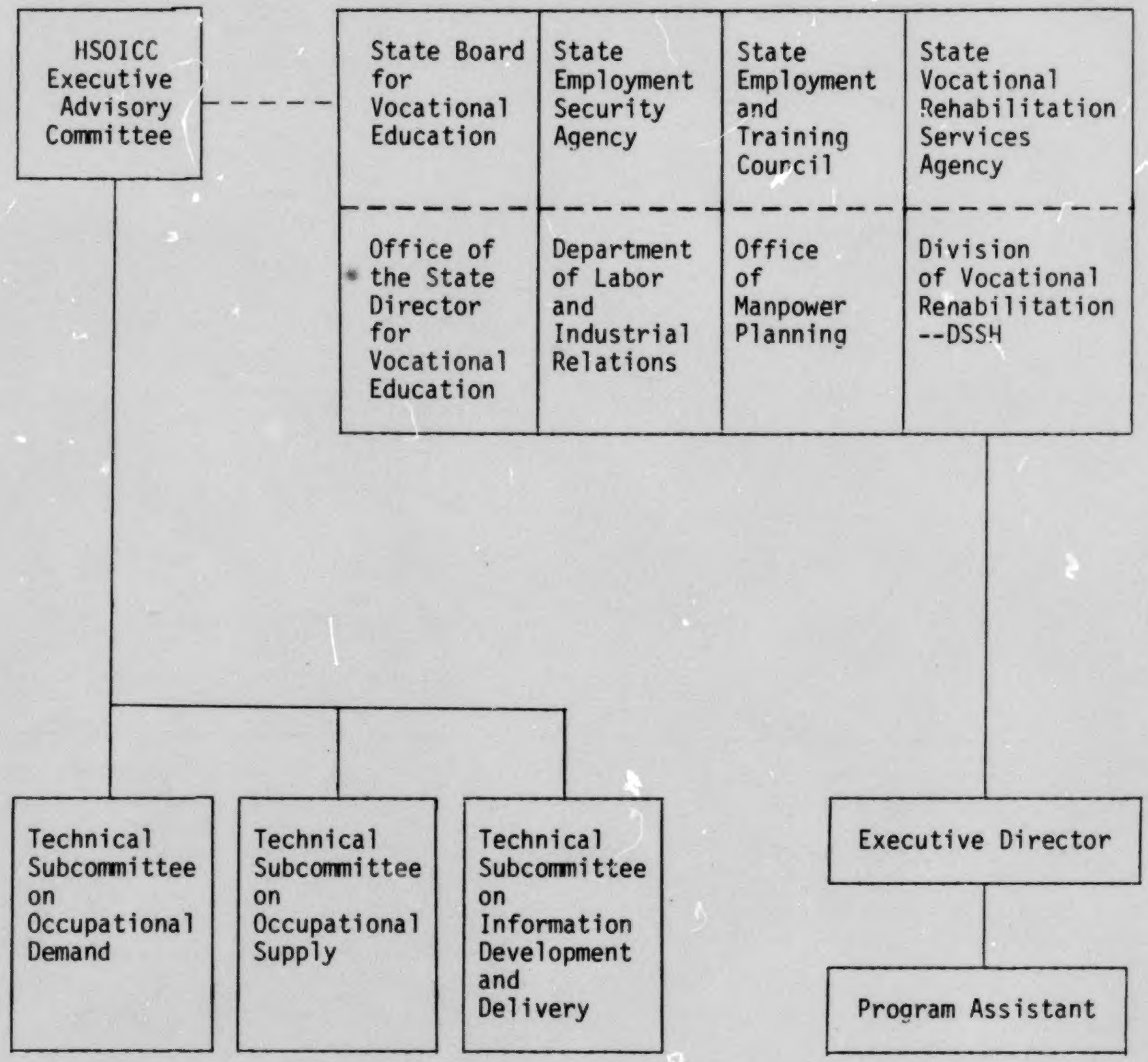
- .State Vocational Education Agency
- .State Employment Security Agency
- .State Employment and Training Council
- .Vocational Rehabilitation Agency

Although these are the only agencies that may vote on fiscal matters of HSOICC, appropriate non-voting agencies or organizations participate in an expanded HSOICC organization through the HSOICC Executive Advisory Committee.

The HSOICC structure was created to fill an organizational and informational void and, as such, can be utilized to facilitate and coordinate the development of an OIS which will disseminate the needed information. A diagram of the HSOICC structure, which depicts the organizational interrelationships of the agencies involved, is shown in Exhibit 2-2 on the following page.

To achieve its mandate, HSOICC must use its member agencies to improve the quality of data that will be contained in an occupational information system. HSOICC should function as a focal point to insure that when data gaps are identified, mechanisms are created to fill these gaps. These mechanisms might be a service, survey, or a data collection program performed by a member agency or other appropriate organization. Alternatively, HSOICC could bring together one or more agencies to modify or expand an existing data system. When appropriate,

EXHIBIT 2-2
HSOICC ORGANIZATIONAL INTERRELATIONSHIPS


HSOICC Executive Advisory Committee
State Board for Vocational Education
State Employment Security Agency
State Employment and Training Council
State Vocational Rehabilitation Services Agency
Office of the State Director for Vocational Education
Department of Labor and Industrial Relations
Office of Manpower Planning
Division of Vocational Renabilitation --DSSH
Technical Subcommittee on Occupational Demand
Technical Subcommittee on Occupational Supply
Technical Subcommittee on Information Development and Delivery
Executive Director
Program Assistant

HSOICC should attempt to influence its member agencies to modify relevant programs and systems to improve the quality of the information in an OIS. HSOICC should be the initiator of activity that result in Federal and State agency actions to improve existing programs and systems that provide input for the OIS.

4. OCCUPATIONAL INFORMATION SYSTEM DEFINED

An information system may be thought of as an organization or network for the collection and/or distribution of information. For HSOICC purposes, the information being collected and distributed is related to occupations. An occupational information system should be conceived in generic terms--that is, there are many similar yet distinct methods of structuring the organization or network that will satisfy the purpose and systematic functions of collecting and/or distributing occupational information. That purpose, simply stated, is to provide to users the occupationally related information necessary for decision making. Direct participants in the labor market make decisions about a specific job, a general occupational field, or a career path. Labor market intermediaries assist direct participants in making these decisions. Lastly, planners and administrators make decisions regarding vocational programs and manpower programs that should be offered to students or trainees to maximize their potential job opportunities.

An OIS, therefore, is an organization or network that provides certain types of information related to occupations or to the training relevant for occupations. Basically, there are two major uses of the information included in the OIS. Exhibit 2-3, on the following page, summarizes the two major uses and presents the occupational information base necessary to support these uses.

There is no prescribed operational manner in which OIS information should be made available. An OIS might range from an information clearinghouse to a comprehensive computer-based information system. Potential operational

EXHIBIT 2-3a

OIS INFORMATION BASE AND THE TWO MAJOR USES OF OCCUPATIONAL INFORMATION

Occupational Information Base

I. Occupational Demand Information
- I.1 Current Occupational Employment
- I.2 Job Openings
- I.3 Expansion or Reduction in Occupational Demand
- I.4 Replacement Demand
- I.5 Employment by Industry

II. Occupational Supply Information
- II.1 Enrollments In and Completers and Leavers from Training/Educational Institutions
- II.2 Currently Unemployed
- II.3 Labor Market Net Migration
- II.4 Occupational Transfers
- II.5 New Entrants or Re-entrants to the Labor Force

III. Occupational Characteristics Information
- III.1 Earnings and Benefits
- III.2 Job Duites
- III.3 Work Settings and Conditions
- III.4 Ability and Aptitude
- III.5 Licensing, Registration, and Certification Requirements
- III.6 Education/Training Skill Acquisition Patterns
- III.7 Education/Training Requirements
- III.8 Career Ladders
- III.9 Major Employers
- III.10 Hiring Channels
- III.11 Occupational Titles and Descriptions
- III.12 Inventory and Descriptions of Education and Training Programs
- III.13 Financial Assistance Programs

IV. Complementary Information
- IV.1 Labor Force Demographics and Trends
- IV.2 Additional Sources of Occupational Information
- IV.3 Demographics of Workers by Occupation
- IV.4 Population
- IV.5 Economy

V. Auxiliary Information Necessary to Support Occupational Demand/Supply Analysis (e.g., Cross-Code Relationships)

TO SUPPORT THE PLANNING PROCESS FOR VOCATIONAL EDUCATION PROGRAMS AND MANPOWER TRAINING PROGRAMS

USERS

PLANNERS AND ADMINISTRATORS

TO SUPPORT THE CAREER PLANNING, GUIDANCE, AND JOB SEARCH NEEDS OF VARIOUS TARGET POPULATIONS

USERS

DIRECT PARTICIPANTS IN THE LABOR MARKET

LABOR MARKET INTERMEDIARIES

alternatives for HSOICC to use in implementing an OIS are discussed in greater detail in Chapter V. Regardless of the operational alternative selected for implementation, the OIS must address two very important functions:

- .First, the OIS must be concerned with the delivery of information to diverse users. Perhaps the most important delivery consideration is the methods by which information will be presented to the various user groups. This topic is addressed in detail in Chapter IV.

- .Second, and equally important, an integral function of the OIS is to provide training and technical assistance to various users in the interpretation and usage of the information provided by or through the OIS network. This function must include explanations of how the data can potentially be used in the planning process and the limitations of the data that users should recognize.

There are certain levels of detail or specificity necessary within an OIS to adequately satisfy the various user populations. In large part, HSOICC must rely on national leadership and action to meet these needs. NOICC has established certain policies that are applicable in defining the OIS levels of detail or specificity (see the Federal Register of July 19, 1978, as a reference). In particular, there are three dimensions of the OIS for which the level of specificity should be considered:

- .Occupational detail
- .Geographic detail
- .Time reference period

Each of these dimensions will be discussed separately in the sections that follow.

(1) Occupational Detail

There are presently four occupational classification structures and two instructional discipline taxonomies that are being utilized to categorize either occupations or educational programs. These include:

- .Dictionary of Occupational Titles (DOT) Codes, Fourth Edition

- .Occupational Employment Statistics (OES) Survey and Matrix Codes

.Standard Occupational Classification (SOC) Codes

.Census Occupational Codes

.U.S. Office of Education (USOE) Codes

.Higher Education General Information Survey (HEGIS) Codes

NOICC has adopted the Standard Occupational Classification (SOC) Manual of the Office of Federal Statistical Policy and Standards, U.S. Department of Commerce, as a standard overall occupational classification system. To date, however, the SOC has yet to be used for any data collection or statistical analysis efforts. The SOC is fully compatible with the DOT Fourth Edition and there is an Index to the SOC that provides a cross reference between the DOT occupational titles and codes and the SOC titles and codes. Since the OES survey and matrix codes are also compatible with the DOT, the SOC manual is therefore compatible with the OES classification structures.

In general, the occupational level of detail reflected in an OIS must be sufficient to accomplish two objectives:

> .To reflect the occupational composition of each labor market area, SMSA, and State
>
> .To meet the needs of users requiring data in the greatest detail

The occupational detail in an OIS should be sufficient to identify all occupations that have different training requirements. On a continuum of detail with regard to occupations, the various occupational classification structures compare as follows:

Greatest Detail	Moderate Detail		Least Detail
DOT, Fourth Edition	OES Survey	SOC	Census
(20,000)	(1,700)	(660)	(441)

The above diagram shows the approximate number of occupational titles included in each structure. In summary, if the occupational detail in an OIS can satisfy the needs of those users requiring the greatest detail, then data can always be aggregated to satisfy the needs of users who require less detailed data. The only constraint on the occupational level of detail in an OIS is that certain member agency programs, which will provide input to the OIS, may require a certain level of internal detail to satisfy technical considerations in assuring the development of accurate and reliable occupational data (e.g., the Occupational Employment Statistics (OES) program).

(2) Geographic Detail

NOICC has adopted the labor market area or labor area concept, as defined by the Department of Labor, as the basic geographic subdivision for development and use of occupational information. In the

Employment and Training Administration's publication Directory of Important Labor Areas, the labor area is defined as follows:

> ". . . a geographic area consisting of a central city or cities and surrounding territory within commuting distance. Conceptually, it is an economically integrated unit within which workers may readily change jobs without changing their place of residence. The labor area takes its name from the central city (or cities), but may include one or more entire counties, except in New England where towns are considered the major geographical units."

Generally, the labor market area is the most appropriate geographical unit for the analysis of occupational supply and demand data. Accordingly, the labor market area should be the smallest geographical subdivision for which data are available in an OIS. Other geographic subdivisions for which data may be available in an OIS include SMSAs, the State, and the Nation.

(3) Time Reference Period Detail

To be effective, an OIS will need to provide data that encompasses three basic time reference periods:

.Historical information

.Current information

.Short- and long-term projections

Vocational education planners, high school guidance counselors, and high school students, for example, tend to need long-term information. Job seekers, on the other hand, need current information to find suitable work. Planners of short-term training programs need short-term projections to make effective program decisions. Administrators and developers of social economic policies, as well as technicians developing projections, require historical data for analytical purposes.

The timeliness of information availability in the OIS is critical. CETA, for example, includes programs designed to correct short-term imbalances in the labor market. CETA programs, Title II and VI, are funded for only one year at a time and thus require short-term projections for planning purposes. Information for the CETA planning cycle is required in early spring to satisfy the fiscal year program plan requirements. Vocational education, on the other hand, has a longer planning period in that vocational education programs can adapt to long-term occupational trends. The long-term projections needed for vocational education planning are required at the beginning of the calendar year for use in the development of the Vocational Education Annual Plan. Job seekers require current labor market information in the form of specific job vacancy information. In short, different users will require information with different time reference periods, and the OIS must be responsive to these needs.

In summary, the OIS can be described as an information system that:

- .Utilizes data collection procedures established by certain Federally-administered and State-conducted programs for input information.
- .Applies standardized estimating procedures as established by the various Federal programs for ascertaining current information and developing short-term and long-term projections.
- .Relies on uniform definitions as presented (when published) in HSOICC's "Glossary of Terms and Definitions Used in an Occupational Information Program" for inter-program standardization.
- .Provides data that supports the planning process for vocational or occupational education programs and manpower training programs.
- .Provides data or information that supports the career planning, guidance, and job search needs of various target populations.
- .Delivers the necessary occupationally-related information to widely divergent user populations in appropriate formats and within the requisite time frames.

5. PROBLEMS IN DEVELOPING AN OCCUPATIONAL INFORMATION SYSTEM

In utilizing the data collected through programs conducted by member agencies, HSOICC must realize that the data may not be collected primarily for usage in an occupational information system. Usually, some data collection programs are undertaken either for internal management purposes, to satisfy external funding or reporting requirements of the Federal Government, or to accommodate an agency mandate. In any of these cases, the data collected must serve a primary function that is outside the realm of an OIS.

In developing an OIS, subsets of data collected through various member agency programs will be utilized. This lack of direct control over data collection activities could adversely impact the development of the OIS. HSOICC must function in its coordinative capacity to influence its member agencies to provide data that can be meaningfully integrated into an effective system or network of occupationally-related information and data. The OIS will be a

EXHIBIT 2-3b
OIS INFORMATION BASE AND PLANNING CYCLE REQUIREMENTS

OIS BASE

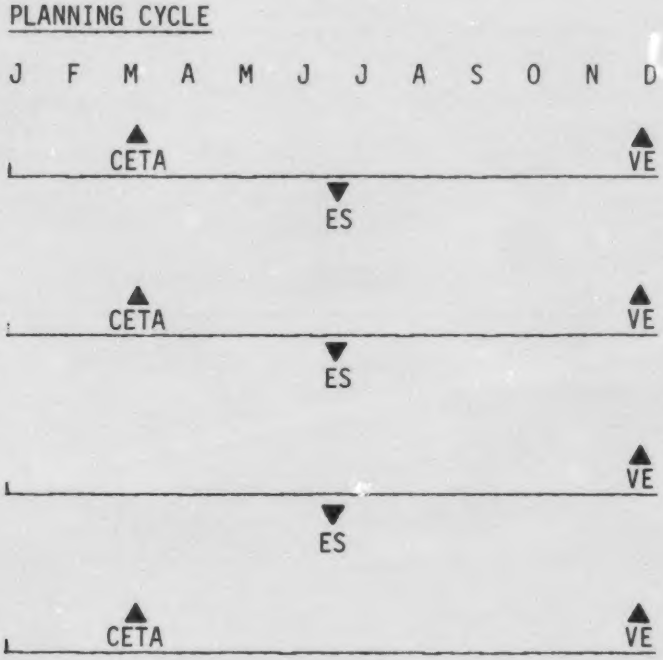
I. Occupational Demand

II. Occupational Supply

III. Occupational Characteristics

IV. Complementary

V. Auxiliary



unique system in that no single organizational structure is responsible for various system functions such as data collection, data analysis, report generation, and dissemination of information. Instead, the situation dictates that multiple agencies may be responsible for one or more of these system functions.

As a result of these various organizational and programmatic constraints, the development of an OIS will be a complex process. HSOICC must facilitate this process as it is responsible for coordinating the available resources to assure the implementation of the OIS.

6. BASIC COMPONENTS OF AN OIS

The detailed structure of an OIS will be discussed in Chapter III. The purpose of this section is to introduce the components of an OIS. Basically, the components of an OIS can be classified in two ways--data categories and analytical procedure(s). Initially, an OIS will contain four data categories and one analytical procedure. Exhibit 2-4, on the following page, summarizes the components of an OIS.

Certain programs and data sources can be considered as standards to be utilized in the development of an OIS. These programs and data sources are discussed in further detail in Chapter III and in the Appendices.

- Occupational Demand--The Occupational Employment Statistics program of the Department of Labor is a standard principal source of current and projected occupational employment data at the local, State, and national level.

- Occupational Supply--As principal input, data available from the following data and information sources are standard:

    1. Vocational Education Data System (VEDS)
    2. Higher Education General Information Survey (HEGIS)
    3. State and National Apprenticeship System (SNAPS)
    4. Comprehensive Employment and Training Act (CETA) Reporting
    5. U.S. Employment Service (USES)
    6. Unemployment Insurance Service (UIS)

EXHIBIT 2-4
COMPONENTS OF AN OIS

DATA CATEGORIES

I. Occupational Demand

This component contains information pertaining to the number of job opportunities in specific occupations within a specific geographic area over a given period of time.

II. Occupational Supply

This component contains information pertaining to the number of individuals who are working, seeking work, or may be seeking work in specific occupations within a specific geographic area over a given period of time.

III. Occupational Characteristics

This component contains information pertaining to the requirements for working in specific occupations and general descriptions of the occupations (e.g., wage information related to specific occupations). Information is also provided on the characteristics of individuals who work in a specific occupation and preparation needed.

IV. Complementary Information

This component contains the miscellaneous information necessary to support either the planning, career guidance, or placement process.

ANALYTICAL PROCEDURE(S)

I. Supply/Demand Interface

This component contains the information necessary to relate occupational supply data to occupational demand data and to conduct any necessary analysis; it also identifies, explains, and translates classification and coding systems.

7. Noncollegiate Postsecondary School Survey

8. Vocational Rehabilitation Management Information System

- Career Information--Career information delivery system of the Department of Labor is a standard concept in encouraging the development and use of occupational information for career choice and job search purposes.

These programs and data sources do not represent all of the possible data sources that can be used in the OIS nor are they without limitations themselves. The limitations of the above data sources and programs and the additional data sources that can be included in an OIS are discussed in relation to the detailed structure of the OIS in the next chapter. Additionally, NOICC is currently in the process of developing comprehensive cross-classification materials to support the supply/demand interface process.

7. THE HSOICC ROLE IN THE DEVELOPMENT OF AN OIS

The HSOICC has the responsibility of coordinating the development and implementation of the OIS at the State level. To effectively accomplish this, the HSOICC has the following functional capabilities:

- An understanding of the needs of the users and the extent to which these needs are being satisfied.
- An understanding of the information and data sources available within the State and the limitations of these sources.
- A method of informing users regarding the availability and potential uses of information or data.
- A method of improving the information sources to better meet user needs.

III. STRUCTURE OF AN OIS

An OIS can be described from three viewpoints: (1) its structure, (2) the sources from which the data are derived, and (3) the manner in which the data will be used. A discussion of the structure will be presented in the narrative of this chapter. The data source information will be presented by a series of exhibits. Also, OIS data sources are discussed in detail in Appendices A, B, and C. A detailed discussion of the uses of OIS data will be presented in a subsequent document, the OIS Handbook.

The structure of an OIS is comprised of five basic components, four of which are data categories and one an analytical procedure (see Exhibit 2-4). The four data categories are: (1) occupational demand, (2) occupational supply, (3) occupational characteristics, and (4) complementary information. The fifth component involves a procedure for interfacing and analyzing occupational supply and demand data. Presently, there is no single established procedure to accomplish this, but a variety of methods can be employed. These five components will provide sufficient data to satisfy the basic information needs of most user groups. This chapter describes each OIS component and identifies their respective data sources. An exhibit, following the discussion of each component, summarizes the data categories and appropriate data sources. If you are not familiar with Federal/State data collection and statistical programs, occupational classification systems, or cross-coding procedures, it is recommended that you review Appendices A, B, and C. This chapter is not intended to be a procedural manual for OIS development and implementation, but rather is designed to provide an overview of OIS concepts and data sources. Thus, the following categorical structure for the HOIS can be considered "ideal." The data sources discussed as part of each data category may not completely satisfy the information needs for that data category; however, the data sources cited are the most relevant known sources for the data categories. Many of these sources grew out of reporting and statistical programs while others have developed with new federal programs over the years. Much of the information needs to be evaluated for relevancy and usefulness in Hawaii. Even useful data needs to be analyzed, dialogued, and interpreted with information users.

1. OCCUPATIONAL DEMAND

Occupational demand can be defined as the number of job opportunities in a specific occupation within a defined geographical area at a given point in time. More simply, current occupational demand is the number of jobs presently filled in a specific occupation plus the number of job openings that exist in that occupation. For effective planning, it is necessary to project occupational demand for future periods. This means determining the number of persons needed to fill all job openings in an occupation at some future time. For an OIS it is necessary to have both current and projected occupational demand data. To estimate projected occupational demand, one must utilize data on employment by industry.

1.1 CURRENT OCCUPATIONAL DEMAND

Current occupational demand for qualified workers is composed of two elements: (1) the number of jobs presently filled in an occupation and (2) the number of job openings.

1.11 Current Occupational Employment--Current occupational employment refers to the number of jobs presently filled in a specific occupation. This information is used as a basis for projecting future employment levels and is useful for comparing the rates of growth or decline of various occupations. Data on current occupational employment can be obtained from the following sources:

.Census--Everyfive years, the Department of Commerce, Bureau of the Census conducts a census survey of population. These census surveys are used to estimate the number of persons working in specific occupations. Census-based estimates of current employment levels have the following limitations:

--Occupational titles are supplied by the interviewee and thus are subject to error and inaccuracies

--Occupational titles must be translated to census occupational classifications and may be improperly coded

--Persons who hold multiple jobs are counted only once

--Census occupational classifications provide inadequate detail for certain applications

--Census information is not timely

--Certain census data are based on samples too small to produce reliable estimates for specific geographical areas

.Occupational Employment Statistics Program (Survey Component)--The survey component of the OES Program is used as a basis for estimating the number of jobs presently filled in specific occupations by industry groupings. Occupational employment estimates are produced through the industry-occupation matrix technique. Two types of matrices are produced. The first type is based on the OES survey, an employer-based survey that is carried out on a three-year cycle. The second type is based for the most part on updated decennial census data and is produced for those States that do not have a sufficient base of OES survey data. It is expected that the OES survey-based matrix will entirely replace the older census-based matrix within a few years. The limitations of the census-based matrix are similar to the census itself. OES survey-based estimates of current occupational employment are subject to the following limitations:

--Geographic detail is currently limited to selected SMSAs and statewide

--Self-employed and agricultural workers are not covered by the OES survey although indirect estimates can be made utilizing census data

--All industries are not covered by the OES survey

.HCIDS--The Hawaii Career Information Delivery System is a computer-based source of occupational, career education, training, job and related information. HCIDS is a program function of the Hawaii State Department of Labor and Industrial Relations.

1.1.2 Job Openings--Job openings refer to actual jobs which are immediately available for filling, and for which an employer is actively trying to find or recruit workers. Information on current job openings is critical for effective operation of employment and training programs. Job openings information is needed on a local labor market basis because users are concerned with immediate job opportunities for themselves or their clients. Job openings information can be obtained from the following sources:

.Employment Security Automated Reporting System (ESARS)--Lists current job openings registered with the local Employment Security office by DOT code and by industry code. The data can be aggregated to a labor market area level. ESARS highlights hard-to-fill openings (unfilled 30 days or more). ESARS as a data source has the following limitations:

--Reflects only job openings reported to ES local offices (research indicates that these openings represent a relatively small share of total job openings)

--Occupational coding detail is sometimes inconsistent (i.e., two-, six-, and nine-digit DOT codes are used)

--Procedures for assigning a DOT code to a specific job opening vary among Employment Security local offices

.Employment Service Job Bank--Job Bank provides a computer listing of all unfilled job openings on a given day that are listed with ES local offices. For each job, information is available on job location, occupational title and code, wage rate, employer, and job requirements. Job Bank has the following limitations:

--Only reflects job openings reported to ES local offices

--Distribution of Job Bank information with employer's name attached is sometimes prevented by State disclosure laws

--Not all areas have the Job Bank program

--Procedures for assigning a DOT code to a specific job opening vary among Employment Security local offices.

.Job Flo--A summary, available monthly on microfiche, provides job openings and wage information on frequently listed occupations by geographic area. National data, listed by Job Bank district and State, includes total openings in all frequently listed occupations. Job Flo has the following limitations:

--Only reflects job openings reported to ES local offices

--Data are limited to those States or sub-State areas which have Job Bank

.HCIDS--The Hawaii CIDS will have a summary tape of Job Bank information.

1.2 PROJECTED OCCUPATIONAL DEMAND

Projections of future occupational demand are essential for planning education and training programs and choosing career paths. Projecting occupational demand involves analyzing two major factors: (1) the overall expansion or reduction in the level of occupational demand and (2) replacement demand which is the number of positions that will open because of workers leaving the occupation.

1.2.1 Expansion or Reduction in Occupational Demand--Expansion or reduction in occupational demand can be caused by changes in business organization, union/management agreements, government priorities, natural events, economic conditions, and technological change. To project the demand for an occupation at some future time it is necessary to know the number of persons currently employed in the occupation. This current occupational employment data is available from the Industry/Occupation Matrix based on either census data or Occupational Employment Statistics survey data.

These surveys enable one to approximate the percent distribution of occupational employment by industry. These percentages are adjusted to reflect expected change over time and are multiplied by projections of total industry employment to provide estimates of future employment by occupation. Sources of data for projecting expansion or reduction in occupational demand include:

.Occupational Employment Statistics Program (Industry/Occupation Matrix and Projections Components)--The OES program uses an industry-occupation matrix as the core of its projections system. This matrix shows staffing patterns in terms of the percentage distribution of occupational employment within a given industry. These staffing patterns are multiplied by projected industry employment levels to obtain projected occupational employment by industry. These results are summed across industries to derive total projected employment by occupation. The OES program as a source of occupational employment projections has the following limitations:

--Projections are based on data from different sources which differ in employment concept and definition

--Development of an Integrated I/O Matrix (based on both census and OES survey data) requires complex data processing that can only be performed by BLS in Washington at present

.HCIDS--Economic outlook information for occupations is included in the system.

1.2.2 Replacement Demand--Replacement demand refers to the number of job openings that will occur as a result of individuals leaving their occupation because of retirement, death, personal reasons, an occupational transfer, or migration to another labor market. These positions are not new positions, but nevertheless must be filled by qualified workers. The following sources can be utilized in the determination of certain components of replacement occupational demand.

.Table of Working Life--Vital Statistics--Labor force separations and death rates, calculated from working life tables and occupational age-sex distributions, are used in the OES program to estimate projected job openings because of labor force attrition. These rates have the following limitations:

--Attrition rates are based only on age-sex distributions and ignore many key variables such as education level of workers, pension benefits, occupational hazards and diseases, working conditions, etc.

--Rates based on census occupational categories cannot be easily translated to different occupational classification structures

--Age-sex distributions are generally not available for sub-State areas

--It is difficult to construct an occupation specific table of working life

.Census--This source has provided five-year occupational mobility rates for all census occupations. This source for occupational mobility data has the following limitations:

--Occupational mobility data will not be collected in the 1980 census

--Classification, reporting, and sampling errors may be high

--The data are not timely

.Employment Service Potential (ESP)--The ESP program makes available industry data on total employment, total hires, openings, referrals, placement, turnover rates, market penetration, referrals per opening, referrals per placement and penetration rate by ES local office area. As a data source for replacement data, the ESP has the following limitations:

--No occupational detail is available in this program

--Turnover rates are not accurate for larger firms

1.3 EMPLOYMENT BY INDUSTRY

Data on total employment by industry is used in the OES program to prepare a base-year Industry/Occupation Matrix. These industry employment figures are used as control totals in determining the occupational employment distribution for each industry. The Standard Industrial Classification (SIC) Manual, revised in 1972, is the classification system utilized in categorizing industry employment data. Industrial employment figures are published by the State Employment Security Agency in their monthly newsletters and the Annual Planning Information (API) that are part of the Labor Market Information (LMI) program. The following data sources provide data on employment by industry.

.Unemployment Insurance Data (ES-202 Reports)--The ES-202 is a quarterly report of employment and wage data obtained from private employers and government entities reporting unemployment insurance payroll taxes. This is the most complete and detailed record available of employment by industrial activity and wages paid to workers. Limitations of ES-202 data include:

--Data are at least six months old when available

--No occupational detail is available

--Self-employed, agriculture employment, and domestic workers are not required to report

.Current Employment Statistics (CES) Program (BLS 790)--BLS cooperates in collecting data each month on employment, hours, and earnings from a sample of establishments in all nonagricultural activities including government. From these data a large number of series on employment, hours, and earnings in considerable industry detail are prepared and published monthly for the United States as a whole, for each of the 50 States and District of Columbia, and for most of the metropolitan areas. Limitations of CES data include:

--No occupational detail is provided, only industry employment figures

--CES data are not directly comparable with ES-202 because of differences in coverage; however, over time the trends are similar

--There are some gaps in the local area coverage of the data

Exhibit 3-1, on the following page, presents a data source matrix for the occupational demand data category.

EXHIBIT 3-1
DATA SOURCE MATRIX--OCCUPATIONAL DEMAND

DATA CATEGORIES / DATA SOURCES		OCCUPATIONAL DEMAND				
		Current Occupational Demand		Projected Occupational Demand		
		Current Occupational Employment	Job Vacancies	Expansion/ Reduction Demand	Replacement Demand	Employment by Industry
CENSUS	A 2-3	A-2			●	
CES	A 4-5					●
ESARS	A 12-13		●			
ESP	A 14-15				●	
JOB BANK	A 18-19		●			
JOB FLO	A 18-19		●			
OES	A 28-31	●		●		
TABLE OF WORKING LIFE-VITAL STATISTICS	A 38				●	
UI DATA (ES-202)	A 39-40					●

NOTES:

This matrix is intended to facilitate cross referencing to the appendices. Page numbers in the table correspond to the page numbers on the data source descriptions found in the appendices.

Data sources identified for each data category are not necessarily definitive or comprehensive.

2. OCCUPATIONAL SUPPLY

Occupational supply may be defined as the number of workers, in a specific labor market, that are available and qualified to fill jobs in an occupation. Current supply is the number of workers already employed in the occupation plus the number of unemployed persons qualified for and seeking work in the occupation. Projected supply may be defined as the number of workers expected to be available and qualified to work in an occupation at some future date, measured as the current supply plus the new entrants, minus labor force separations.* Data on new entrants to the labor supply for a specific occupation in a given geographical area are essential in an OIS. The following groups contribute to the supply of qualified persons actively seeking employment in a specific occupation (see Exhibit 3-2 on the following page for a graphic overview of occupational supply).

.Completers and leavers from training/educational institutions

.Currently unemployed

.Labor market net migration

.Occupational transfers

.New entrants and re-entrants to the labor force

2.1 ENROLLMENTS IN AND COMPLETERS AND LEAVERS FROM TRAINING/EDUCATIONAL INSTITUTIONS

Colleges, universities, public and private vocational/technical schools, high schools and other training/educational institutions contribute to the supply of qualified individuals seeking employment in a specific occupation. Data from these institutions are fragmented, dissimilar, and generally not easily related to specific occupations. For an OIS, it is necessary to obtain

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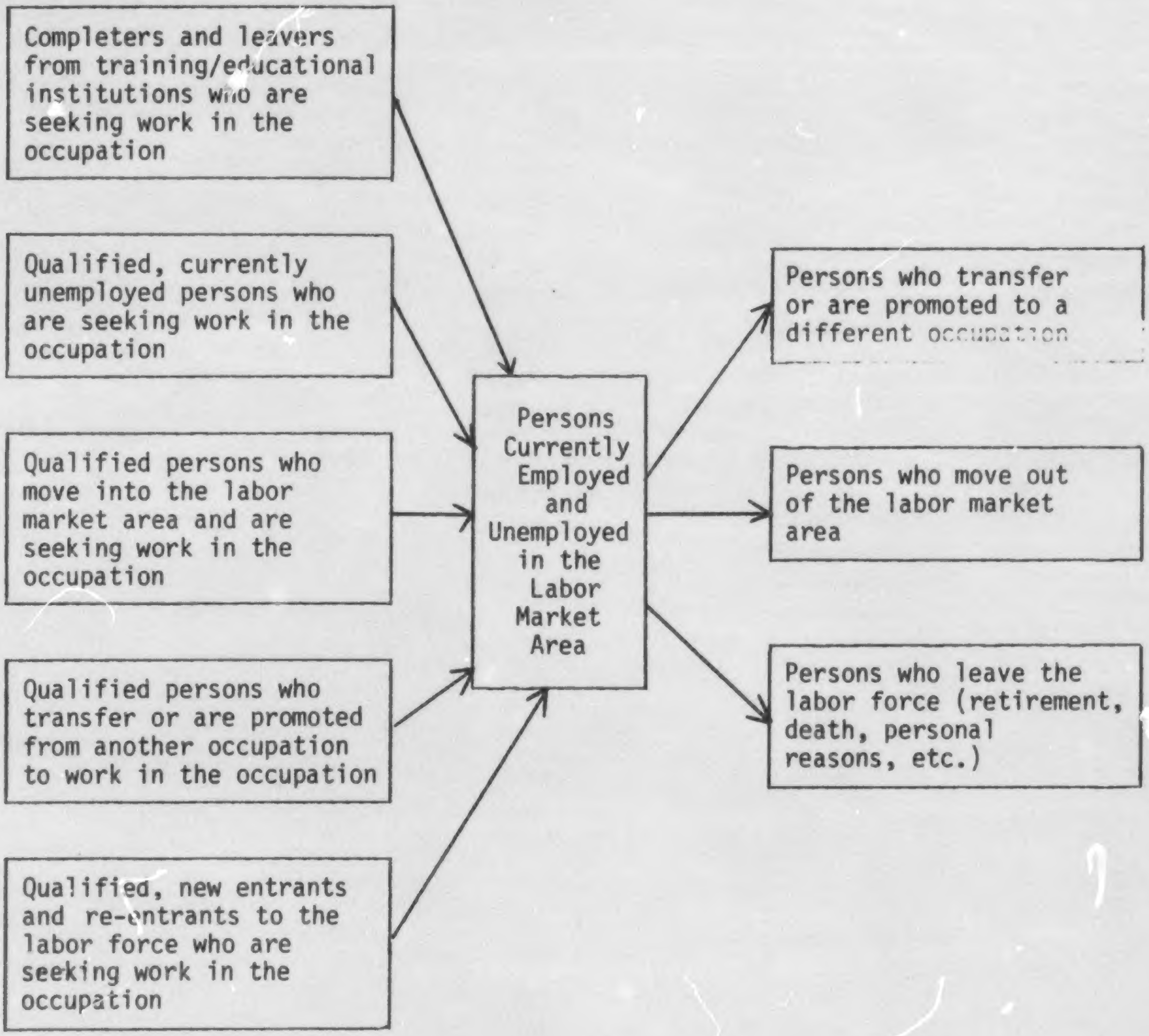
*For an in-depth discussion of occupational supply read "Occupational Supply: Concepts and Sources of Data for Manpower Analysis," Bulletin 1816, 1974, U.S. Department of Labor, Bureau of Labor Statistics

EXHIBIT 3-2
OVERVIEW OF LABOR SUPPLY FOR A SPECIFIC OCCUPATION


Completers and leavers from training/educational institutions who are seeking work in the occupation
Qualified, currently unemployed persons who are seeking work in the occupation
Qualified persons who move into the labor market area and are seeking work in the occupation
Qualified persons who transfer or are promoted from another occupation to work in the occupation
Qualified, new entrants and re-entrants to the labor force who are seeking work in the occupation
Persons Currently Employed and Unemployed in the Labor Market Area
Persons who transfer or are promoted to a different occupation
Persons who move out of the labor market area
Persons who leave the labor force (retirement, death, personal reasons, etc.)

NOTE: These categories accurately reflect labor supply but complete data is not available for each category.

enrollment, completion, and follow-up data on students by instructional program or occupation. Enrollment data indicate the number of persons who may become part of the supply at a future date. Completion data enable analysts to estimate the percentage of current or future trainees who will have acquired the skills required to be qualified for an occupation. Follow-up data allow for an analysis of the percentage of persons leaving with adequate skills, who seek and/or obtain work in an occupation related to their training. With these data, occupational supply from training/educational institutions can be estimated as in the following example:

Enrollment	x	% acquire skills (completion data)	x	% actually seek/obtain work in occupation (follow-up data)	=	supply
100	x	90% = 90	x	80%	=	72

The following are sources for data on enrollments in and completers and leavers from training/educational institutions:

.Vocational Education Data System (VEDS)--VEDS will provide enrollment, completion, program leavers and follow-up data for public secondary, post-secondary, and adult vocational programs. Data are to be reported by selected six-digit USOE program categories with certain follow-up data reported by SOC code. VEDS as a data source has the following limitations:

--Sufficient funding may not be available to obtain the data in the desired level of detail

--Data collection may overlap with HEGIS especially at the junior and community college level (for sub-baccalaureate degrees)

--Apprenticeships (regardless of hours) are combined with long-term adults (500 hours or more)

--VEDS only covers programs included in the Vocational Education State Plan

--Follow-up data may be based on a limited sample size

--Program categories may be limited in detail

--Follow-up data will be classified using only two-digit SOC codes

--Short-term adults (less than 500 hours) are not identified by detailed program

--No follow-up data will be collected for short-term adults or leavers completing less than 50 percent of a program

.Higher Education General Information Survey (HEGIS)--HEGIS covers accredited public and private colleges and universities that grant Associate Degrees or higher. Also, a limited number of proprietary schools are included. Annual enrollment data are available by level of study, but not by field of study. Data on degrees conferred, by level and field of study, are collected annually. HEGIS data have the following limitations:

--The HEGIS taxonomy is unique and has limited detail, however plans call for modifications to increase compatibility with the proposed VEDS taxonomy

--Limited follow-up studies are conducted

--There is a lack of awareness of unpublished data that is only available on computer tapes or microfiche

--Although completion data are available by field of study, enrollment data are not (in previous years, enrollment data were available)

--The data does not allow for any estimates of the number of individuals leaving prior to program completion

--Non-accredited colleges and universities are excluded from HEGIS

.Noncollegiate Postsecondary School Survey--This is a biennial mail survey conducted by NCES of all known public and private (proprietary and non-profit) schools that offer occupational programs at less than the baccalaureate level. Schools covered by HEGIS are not covered. As a source of supply data the survey has the following limitations:

--Data are not collected annually

--Completer/leaver data for each school are not available for 1978 and prior years (questions have been added to 1980 survey)

--Data on program costs and duration are available only on a national basis (participating States can sample to gather these data)

.CETA Prime Sponsors Reporting Requirements--New CETA legislation will require prime sponsors to describe training activities by target occupation. The availability of these data will have to be individually arranged between each prime sponsor and the SOICC. CETA prime sponsor data have the following limitations:

--CETA funded students may already be counted in the Vocational Education Data System (VEDS)

--Reporting systems are not comparable among prime sponsors

--There is no long-range follow-up of CETA trainees

.State National Apprenticeship System (SNAPS)--Through SNAPS the Bureau of Apprenticeship and Training (BAT) maintains records of new registrations, completions, and cancellations of apprenticeships for each apprenticeable trade, by State. Local data may sometimes be developed by inspecting individual program records at the State Apprenticeship Council or BAT. SNAPS data have the following limitations:

--SNAPS data are not comprehensive because unregistered apprenticeship training occurs frequently in industry

--DOT coding procedures vary among States

.Vocational Rehabilitation Management Information System (MIS)--Many States operate a Vocational Rehabilitation MIS to satisfy the statistical reporting requirements of the Rehabilitation Services Administration (RSA). RSA has established statistical reporting standards in the Rehabilitation Services Manual in 1974. The basis of the standardized system of statistical reporting is Form SRS-RSA-300, the Case Service Report. This form requires occupational coding using a four-digit DOT. Limitations of this data source include:

--Occupational coding procedures are inconsistent since vocational rehabilitation counselors may be using an abridged list of DOT titles and codes rather than the DOT itself

--Four-digit DOTs may not provide sufficient detail for certain applications of the data

--Five employment situation codes are used in the RSA reporting standards that are not compatible with the DOT or other occupational classification structures

.HCIDS--Balance of supply/demand information by occupation is in the system

2.2 CURRENTLY UNEMPLOYED

Data on unemployed individuals seeking jobs provide a measure of supply for specific occupations. For example, if a large number of individuals with specific occupational skills are unemployed, it is likely that a surplus of qualified workers exists. Sources of data on the currently unemployed include:

.Unemployment Insurance (UI)--The ES-203 reports provide demographic data on persons in active unemployment insurance status. Data are available by occupational and industrial attachment. The ES-210 report summarizes local office claims on a monthly basis. Unemployment insurance data have the following limitations:

--The data include only persons covered by an insured unemployment program

--ES-203 data in most States are available only on tape

--ES-203 data are limited by sample size, field office response, and accuracy of occupational coding

--ES-210 shows only gross number of claimants

.Employment Service Automated Reporting System (ESARS)--The system provides data on employment security transaction. Information is available on the occupational skills of job applicants. As a data source, ESARS has the following limitations:

--Data are limited to applicants at the ES field offices

--Errors result from the process of assigning DOT codes to classify applicant's occupational skills

--Applicant is only categorized in one occupational category

2.3 LABOR MARKET NET MIGRATION

Occupational supply for a labor market is affected by the migration of workers from one labor market to another. Net migration data should be developed on a National, State, and local labor market area basis. Planners need these data to estimate the extent to which current and future occupational demand will be satisfied by workers who move into an area. Sources of data on net migration include:

.Census--Data from the 1970 Census was used to develop migration estimates between States. Data on occupational mobility can be cross classified with data on geographic mobility. This source has the following limitations:

--Occupational titles are supplied by the interviewee and thus are subject to error and inaccuracies

--Census information is not timely

--Census occupational classifications provide inadequate detail for certain applications

--Occupational titles must be translated to census occupational classifications and may be improperly coded

2.4 OCCUPATIONAL TRANSFERS

Job openings may be filled by persons with a different occupational specialty. Persons move up career ladders within a company or industry into new occupational categories and others make radical career shifts (e.g., teachers become computer programmers). Planners need to estimate how much of current and future occupational demand will be met by persons changing occupations. Information on occupational transfers can be obtained from:

.Census--In the 1970 Census, data were collected on the occupation persons had then and five years previously. Limited national data were published in Bureau of Census Reports. Additional research using census data has been published by the Bureau of Labor Statistics. Occupational transfer data derived from this source have the following limitations:

--Data have limited reliability at geographic levels below national

--Data were based on interviewee's ability to recall his or her occupation five years previously

--Occupational mobility data will not be collected as part of the 1980 Census

--Data have limited use in calculating net mobility rates for occupations

.Current Population Survey--Since the early 1960's, four studies of occupational mobility have been conducted using data from the Current Population Survey. The data show retention of workers in specific occupations from one year to the next. This source has the following limitations:

--Only national data are available due to the sample size

--National data are unreliable for occupations without significant employment

2.5 NEW ENTRANTS OR RE-ENTRANTS TO THE LABOR FORCE

Persons move into and out of the labor force. Common examples include: (1) a woman returning to the labor force after child rearing, (2) a person completing military service, (3) a displaced homemaker, and (4) a person who has been in a prison or hospital. An indication of the magnitude of new entrants or re-entrants can be obtained from the following source:

.Employment Service Potential (ESP)--As part of ESP, social security numbers of employees for a given employer in a given quarter are compared to the social security numbers reported by the same employer in previous or future quarters. This comparison results in an estimate of a firm's new hires and terminations in a calendar quarter. ESP data have the following limitations:

--Data are 5 to 6 months old when available

--Data are available only for a limited number of States

--Occupational specific data are not available

Exhibit 3-3, on the following page, presents a data source matrix for the occupational supply data category.

EXHIBIT 3-3
DATA SOURCE MATRIX--OCCUPATIONAL SUPPLY

DATA CATEGORIES DATA SOURCES	OCCUPATIONAL SUPPLY				
	ENROLLMENT IN & COMPLETERS FROM TRAINING/EDUCATIONAL INSTITUTIONS	CURRENTLY UNEMPLOYED	LABOR MARKET NET MIGRATION	OCCUPATIONAL TRANSFERS	NEW ENTRANTS, RE-ENTRANTS TO THE LABOR FORCE
CENSUS A 2-3			●	●	
CETA REPORTING A 6	●				
CPS A 7-8				●	
ESARS A 12-13		●			
ESP A 14-15					●
HCIDS					●
HEGIS A 16	●				
NONCOLLEGIATE POSTSECONDARY SCHOOL SURVEY A 26	●				
SNAPS A 35-36	●				
STATE EDUCATION MIS A 37	●				
UI DATA A 39-40		●			
VEDS A 41-44	●				
VOCATIONAL REHABILITATION MIS A 45-46	●				

NOTES:

This matrix is intended to facilitate cross referencing to the appendices. Page numbers in the table correspond to the page numbers on the data source descriptions found in the appendices.

Data sources identified for each data category are not necessarily definitive or comprehensive.

3. OCCUPATIONAL CHARACTERISTICS AND PREPARATION

Information related to the characteristics of occupations is needed for planners to determine course and program content. Also, these data are essential for effective counseling, guidance, and job search purposes. Vocational rehabilitation counselors can utilize this information to assess the appropriateness of specific occupations for their clients. Occupational characteristics data should reflect the local employment environment. This section describes the occupational characteristics data that should be available in an OIS.

3.1 EARNINGS AND BENEFITS

Information is needed on the compensation paid to workers, including commissions, bonuses, and fringe benefits. Wages are usually paid by the hour for work rendered. Salaried positions usually assume a minimum number of hours for which payment is made. Earnings data, one of the most frequently requested items of information, are essential for an OIS.

Earnings data are needed on a labor market area, State, and national basis. The data should be timely, as inflation and union contracts cause earnings and benefits to change often. Earnings data can be obtained from the following sources:

- BLS Area Wage Surveys (AWSs)--The Area Wage Surveys are conducted annually and provide wage data for occupations common to a wide variety of industries in the areas surveyed. The AWSs are reputed to be the best planned and most reliable survey of wages. The AWSs have the following limitations:

  --They only cover limited geographic areas of the nation, not Hawaii

  --They are limited in the number and type of occupations covered

- Industry Wage Surveys--Industry wage surveys (conducted by BLS) provide data for occupations selected to represent the full range of activities performed by workers. Fifty manufacturing and twenty nonmanufacturing industries, accounting for about 22.5 million employees, are surveyed on a regularly recurring basis. A majority are studied on a five-year cycle, but a number of comparatively low-wage industries are on a three-year cycle. These surveys have the following limitations:

--Number of industries covered by these surveys is limited

--Data for certain industries will not be reliable for State and area wage estimates

--The occupational detail for which wage data are available may be limited by survey constraints

.Unions, Professional Associations, etc.--Unions and professional associations occasionally conduct surveys regarding the earnings of their members. These surveys have the following limitations:

--Each survey must be evaluated for statistical validity

--Occupational titles are limited to those represented by the union or professional association

Employment Service Automated Reporting System (ESARS)--Data are available on wages from job applications and job orders filed with local Employment Security offices. ESARS wage data have the following limitation:

--Wages are normally in the lower quarter of the wages paid in the occupation

.Census--Census-based annual earnings data are available for individuals and households. The census earnings data have the following limitations:

--Self-reported earnings estimates may be misstated

--Census data are outdated and should be used only to compare levels of earnings across occupations

--Census classifications preclude comparisons at a detailed level

.Other Wage Surveys--Cities, State governments, and Employer Councils occasionally conduct local wage surveys for specific occupations. These surveys have the following limitations:

--Occupational classifications are usually not standardized

--Surveys sometimes are poorly designed and executed

.Occupational Outlook Handbook (OOH)--The OOH provides a secondary source of information on wages. Data represent a national wage scale and have the following limitation:

--The OOH wage information needs to be supplemented with State and LMA data

.Hawaii Career Information Delivery System (HCIDS)--Wage and earnings data is in the system

3.2 JOB DUTIES

Job duties refer to the specific tasks a worker performs to fulfill job requirements. Knowledge of job duties is mandatory for curriculum development. Also, job duty information is very important to handicapped persons for assessing whether they are capable of performing required physical and mental activities. There may be some differences in job duties for particular occupations in different geographic areas. Job duty information can be obtained from:

- Occupational Outlook Handbook (OOH)--The OOH provides an excellent description of the duties involved in specific occupations. The OOH has the following limitation:
  - --The job duties described are general in nature and may not be locally applicable
- Dictionary of Occupational Titles (DOT)--The DOT provides an overview of key job duties in their occupational descriptions. The DOT as a source of job duty information has the following limitation:
  - --It is not updated frequently enough to preclude descriptions of certain occupations from becoming out-of-date
- Occupational Guides and Brochures--State Employment Security Agencies prepare occupational guides and brochures that include details of the job duties associated with occupations. In these publications, local differences in job duties are noted.
- Dictionary of OES Occupations--This dictionary presents job definitions for those occupations included in the OES Survey. Included in many of the occupational definitions is a description of the job duties associated with that occupation.
- A Guide to Occupations in Hawaii and Occupational Research Project Studies --Both sources come from the OSDVE and cover current and emerging occupations in Hawaii.
- Hawaii Career Information Delivery System (HCIDS)--Job duties are described in the system.

3.3 WORK SETTINGS AND CONDITIONS

Information is needed on the physical, social, and psychological environment in which occupational tasks are performed. These data are used in career counseling, career decision-making, and curriculum development. Work setting and conditions information can be obtained from the following sources:

.Occupational Outlook Handbook (OOH)--The OOH provides a general description of the typical work settings and conditions associated with each occupation.

.Dictionary of Occupational Titles (DOT)--The occupational descriptions provide insight as to typical work settings and conditions.

.Occupational Guides and Brochures--These SESA publications contain descriptions of the working conditions in job settings associated with specific occupations.

.Occupational Safety and Health Administration (OSHA)--This agency and BLS publish several annual reports containing information on accidents, injuries, and fatalities in various occupations.

.Hawaii Career Information Delivery System (HCIDS)--Working conditions for occupations are in the system.

3.4 ABILITY AND APTITUDE

Counselors, planners, and career decision makers require information on the physical, mental, and psychological attributes essential for performing occupational tasks. This information can be obtained from:

.Occupational Outlook Handbook (OOH)--The OOH provides generalized statements on necessary aptitudes and abilities.

.Dictionary of Occupational Titles (DOT)--The supplements to the DOT, Third Edition, provide substantial information in the presentations of the Worker Trait Groups.

.Hawaii Career Information Delivery System (HCIDS)--Abilities and aptitudes for occupations are in the system.

.Occupational Guides and Brochures--These SESA publications describe the abilities and aptitudes required for specific occupations.

3.5 LICENSING, REGISTRATION, AND CERTIFICATION REQUIREMENTS

For certain occupations, job seekers must obtain from a professional society, educational institution, political unit, or labor organization, a formal statement that attests to the individual having met specific standards and criteria. Information on those requirements is necessary for career guidance and decision making. Also, this information is very important to curriculum developers, because it can be translated into specific teaching/learning objectives. Using the data from certifying agencies, it is possible to get a better picture of supply for specific occupations. Data are necessary on a local, State, and national basis. The following sources provide information on licensing, registration, and certification requirements:

- Occupational Outlook Handbook (OOH)--The OOH provides information on a national basis. The OOH has the following limitations as a source for this data:

  --States and/or LMAs can have different requirements for the same occupation

  --OOH information needs to be supplemented with local information

- Dictionary of Occupational Titles (DOT)--The DOT provides information on licensing requirements for selected occupations. As a source for this data, the DOT has the following limitation:

  --Information is only available for a limited number of occupations

- Occupational Guides and Brochures--These SESA publications will generally include State specific licensing, registration, and certification requirements. In some states, the SESA will prepare a special publication that indicates which occupations require licenses and how and where these licenses may be obtained.

- ETA and SESA Publications--In several States, the State Employment Security Agency publishes a document describing the licensing, registration, and certification requirements for occupations within the State. ETA is currently in the process of preparing a monograph that will provide national information in this area.

- A Guide to Occupations in Hawaii and Occupational Research Project Studies --Both sources come from the OSDVE and cover current and emerging occupations in Hawaii.

- Hawaii Career Information Delivery System (HCIDS)--Occupational requirements such as licensing are in the system.

3.6 EDUCATION/TRAINING SKILL ACQUISITION PATTERNS

Information is needed on the typical manner in which one acquires the education/training and skills necessary to perform occupational tasks. This information is available from:

- Occupational Outlook Handbook (OOH)--General information is available on many occupations

- Occupational Guides and Brochures--These SESA publications provide information describing how individuals may obtain the necessary skills to perform occupational tasks.

- A Guide to Occupations in Hawaii and Occupational Research Project Studies--Both sources come from the OSDVE and cover current and emerging occupations in Hawaii.

- Hawaii Career Information Delivery System (HCIDS)--Preparation channels and tips are in the system.

3.7 EDUCATION/TRAINING REQUIREMENTS

Planners, counselors, and career decision makers must have information on the formal education and training necessary to qualify for employment in a specific occupation. Information can be obtained from:

- Occupational Outlook Handbook (OOH)--Information is provided on the typical education and training requirements for various occupations.

- Dictionary of Occupational Titles (DOT)--The Worker Trait Groups information can be used to infer the education and training that is typical for selected occupations. In particular, the Specific Vocational Preparation (SVP) and General Educational Development (GED) indicators are useful in this regard.

- Occupational Guides and Brochures--These SESA publications provide State and local information with regard to the education and training requirements for selected occupations. In those instances where State and local requirements differ from national patterns, these differences are highlighted.

- A Guide to Occupations in Hawaii and Occupational Research Project Studies--Both sources come from the OSDVE and cover current and emerging occupations in Hawaii.

- Hawaii Career Information Delivery System (HCIDS)--Required education and training information for specific occupations is in the system.

3.8 DEMOGRAPHICS OF WORKERS BY OCCUPATION

Information is needed on the distinguishing traits, features, or qualities of persons currently employed in specific occupations. Available information should include sex, age, race, socio-economic status, and educational attainment. This information is useful for career guidance and is necessary for analyzing occupational areas of discrimination or under-representation including instances of sex bias and stereotyping. The following are sources for these data:

.Census--The census provides demographic data on the labor force. The census does have the following limitations:

--Census information is not timely and is outdated quickly

--Occupational titles are supplied by the interviewee and thus are subject to error and inaccuracies

--Census occupational classifications provide inadequate detail for certain applications

.Current Population Survey--The CPS can provide a demographic profile of certain occupational fields. For national purposes, these profile estimates would be adquate. However, CPS data do have the following limitation:

--The sample size of the CPS may be too small to permit detailed analysis of certain occupations or to provide State and area data

.Professional Associations--Many associations publish reports describing the demographic characteristics of their membership. To the extent that their membership represents specific occupational fields, this information is useful in preparing a demographic profile of an occupation.

3.9 CAREER LADDERS

Career ladder refers to a potential progression of job responsibilities, skill attainments, and advancement possibilities within an occupational field. This information is essential for career guidance and curriculum development. Career ladder information can be obtained from:

.Occupational Outlook Handbook (OOH)--General data are available for many occupations.

.State Apprenticeship Agencies, Professional Associations, Unions, etc.--These sources of data cover occupational areas appropriate to their memberships or apprentice programs. A major limitation of these data sources is:

--The publications may not reflect the actual career ladder that exists within an occupation

3.10 MAJOR EMPLOYERS

Placement counselors and jobseekers need to know employers of persons with specific occupational skills. This information can be obtained from:

.Employer Directories--These types of publications are generally found in most States. These directories may provide information on local, State, or national employers.

- Unemployment Insurance Data (ES-202 Report)--The ES-202 Report can provide a quarterly listing of employers covered by the Federal Unemployment Tax Act (FUTA) and/or relevant State Employment Security laws. The listing will provide employer names by industrial classification. Using OES survey data in conjunction with the ES-202 report, it is possible to develop rough estimates of the occupational structure within specific firms. A major limitation of this data source is:

  --Confidentiality problems might prevent the publication of certain employer-specific information collected either for the ES-202 report or through the OES survey

- A Guide to Occupations in Hawaii and Occupational Research Project Studies --Both sources come from the OSDVE and cover current and emerging occupations in Hawaii.

3.11 HIRING CHANNELS

To facilitate job search activities, it is necessary to have information on the procedures that employers use to identify, evaluate, and hire new employees. Information on hiring channels can be obtained from:

- Employment Service Automated Reporting System (ESARS): ESARS data provide an indicator of the process employers use in selecting new employees.
- Occupational Guides and Brochures--These SESA publications often contain information on the best means of job entry.
- Hawaii Career Information Delivery System (HCIDS)--Information on hiring methods by occupation is in the system.

3.12 OCCUPATIONAL TITLES AND DESCRIPTIONS

Occupations can be defined and specific by describing the tasks performed and identifying the tools, machines, aids, and materials used on the job. Occupational titles and descriptions provide a basis for categorizing employment data and thus allowing systematic analysis of that data. Occupational titles and descriptions also provide a structure for presenting career guidance and job search information and aid in illustrating the inter-relationships among occupations. Identification of related occupations allows for clustering of occupations for analytical purposes. Information on related occupations is also useful for career guidance and curriculum development. The following are the sources of occupational titles and descriptions:

- Dictionary of Occupational Titles (DOT)--The DOT is the most comprehensive reference; however, it has the following limitation:

  --The number of job titles may hinder their use in career development and planning activities

- Census--The census provides titles for approximately 400 occupational categories. The following limitations exist:

  --Definitions are not provided for the occupational titles

  --Occupational groupings include a wide range of skill levels

  --There may be too few occupational classifications for certain applications

  --The Census occupational titles cannot be easily related to other occupational classification structures

- Standard Occupational Classification (SOC)--The SOC is a compromise between the census, DOT, and OES classifications, but has the following limitations:

  --The current SOC does not include a reference to all existing occupational groupings

  --Further work is required to refine the SOC

  --Occupational groupings include a wide range of skill levels

  --There may be too few occupational classifications for certain applications

- Occupational Employment Statistics (OES)--This occupational classification structure contains approximately 1,700 occupational categories. Definitions and descriptions of the occupational categories are provided in the Dictionary of OES Occupations. The OES classification structure has the following limitations:

  --OES does not contain the occupational detail of the DOT

  --No agricultural occupations are included in the OES

- Hawaii Career Information Delivery System (HCIDS)--Occupational titles, including specialties and descriptions, are in the system.

3.13 INVENTORY AND DESCRIPTIONS OF EDUCATION AND TRAINING PROGRAMS

Counselors, potential students, and administrators need a listing of existing education and training programs and the schools that offer the programs.

Information is needed on the costs, the duration of the course, course content, and course objectives. Information on existing education and training programs can be obtained from:

.Vocational Education Data System (VEDS)--The VEDS system will provide substantial data on programs at public high schools and community colleges. As a source of data, VEDS has the following limitations:

--Does not cover proprietary schools

--Initially, information pertaining to individual schools and programs may not be available

.State Education Management Information System (MIS)--States currently collect substantial data from the public high schools and community colleges. Generally, these systems have the following limitations:

--Do not cover proprietary schools

--Accuracy of data is sometimes questionable

.Noncollegiate Postsecondary School Survey--NCES conducts a biennial mail survey of all known public and private schools that offer occupational programs at less than the baccalaureate level. Enrollment data, by sex and full-time/part-time status, are collected for each program offered and are coded using the USOE classification system. The schools participating in the survey are included in the Directory of Postsecondary Schools with Occupational Programs, published biennially. As a source of data, the survey has the following limitations:

--Data are not collected annually

--Data on costs and duration of programs are available only on a national basis. (Participating States can sample their schools to gather these data.)

.School Catalogues--Many proprietary and public schools publish catalogues or pamphlets to describe their course offerings. Data are normally provided on course duration, teaching approach, costs, and course content. As a data source, catalogues have the following limitations:

--Not published by all schools

--Usually do not provide data on enrollments, completions, or placements

--Standard definitions are not typically used

.Higher Education General Information Survey (HEGIS)--HEGIS reports provide information on accredited public and private colleges and universities that grant associate degrees or higher. In addition, a limited number of proprietary schools are included. Data are available on computer tape at the institution level.

- .State and National Apprenticeship System (SNAPS)--SNAPS produces output reports that display data on apprentice actions and characteristics by occupations, industries, and programs on a national, regional, and State basis. Also, summaries are provided on the number of registered programs, by type of program and by Bureau of Apprenticeship Training (BAT) or State Apprenticeship Agencies (SAC) assignment.

- .Hawaii Career Information Delivery System (HCIDS)--The system includes information on schools and education/training programs.

Exhibit 3-4, on the following page, presents a data source matrix for the occupational characteristics data category.

3.14 FINANCIAL ASSISTANCE

Information on sources of financial assistance to students/trainees is very useful. To take advantage of available assistance, individuals first must be informed of the types of assistance that exist, the criteria used to grant assistance, and the process for applying. If all students are aware of the potential sources of financial assistance, then there can be equitable competition for and distribution of financial aid. Information on financial assistance can be obtained from:

- .School Catalogues--Schools may award scholarships, grants, or loans to needy students or students with special interests or abilities.

- .OE Grants and Assistance Programs--Information is provided by DHEW describing grants and assistance programs available from the Office of Education.

- .Hawaii Career Information Delivery System (HCIDS)--Financial aid information will be in the system.

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EXHIBIT 3-4
DATA SOURCE MATRIX--OCCUPATIONAL CHARACTERISTICS AND PREPARATION

DATA CATEGORIES / DATA SOURCES		OCCUPATIONAL CHARACTERISTICS AND PREPARATION												
		EARNINGS & BENEFITS	JOB DUTIES	WORK SETTINGS & CONDITIONS	ABILITY & APTITUDE	LICENSING, REGISTRATION, & CERTIFICATION REQUIREMENTS	EDUCATION/TRAINING SKILL ACQUISITION PATTERNS	EDUCATION/TRAINING REQUIREMENTS	CAREER LADDERS	MAJOR EMPLOYERS	HIRING CHANNELS	OCCUPATIONAL TITLES & DESCRIPTIONS	INVENTORY & DESCRIPTION OF EDUCATION & TRAINING PROGRAMS	FINANCIAL ASSISTANCE
AREA WAGE SURVEYS	A 1,17,47	●												
CENSUS	A 2-3	●										●		
CPS	A 7-8													
DLIR PUBLICATIONS		●	●			●				●	●	●		
DOT	A 9-11		●	●	●	●		●				●		
ESARS	A 12-13	●									●			
HCIDS		●	●	●	●	●	●	●		●	●	●	●	●
HEGIS	A 16												●	
NONCOLLEGIATE POSTSECONDARY SURVEY	A 26												●	
OCCUPATIONAL GUIDES & BROCHURES	A 32		●	●	●	●	●	●			●			
OE GRANT/SCHOOL CATALOGS													●	●
OES	A 28-31		●									●		
OOH	A 33	●	●	●	●	●	●	●	●					
OSHA				●										
SOC	B 11-14											●		
SNAPS	A 34	●							●				●	
STATE EDUCATION MIS	A 37												●	
UI DATA	A 39-40									●				
VEDS	A 41-44												●	

NOTES: This matrix is intended to facilitate cross referencing to the appendices. Page numbers in the table correspond to the page numbers on the data source descriptions found in the appendices.

Data sources identified for each category are not necessarily definitive or comprehensive.

4. COMPLEMENTARY INFORMATION

The complementary information component provides a mechanism for incorporating various data related to occupational information needs into an OIS. Complementary information can be tailored for planning, career guidance, or job search purposes. Although a wide variety of data can be incorporated, the following information, at a minimum, should be made available through an OIS.

4.1 LABOR FORCE DEMOGRAPHICS AND TRENDS

Demographic data such as age, sex, race, educational attainment, and occupation, are needed on the employed, the unemployed, and persons not in the labor force. This information is needed to identify special needs of or potential discrimination against groups such as the elderly, the young, and minority groups. Demographic data are important for planners to determine trends or changes in the supply of workers. Information on labor market trends provides insight into the economic structure of an area or community, its industrial base, and the economic changes that have taken place or can be expected. Labor market demographic and trend data can be obtained from:

- Labor Market Information (LMI) Program--The Annual Planning Information (API) report published by the State Employment Security Agency provides information on a statewide basis and for large SMSAs. The API should provide historical, current, and outlook information on employment, unemployment, and occupational trends, as well as numbers and characteristics of the population and labor force, unemployed, economically disadvantaged, underutilized persons, and other special groups.

- Census--The census is the most comprehensive source of demographic data on the population of the United States. However, the census data has the following limitation:

  --Census information is not timely

- Current Population Survey (CPS)--Data is collected monthly through a survey of 55,000 households throughout the country. The CPS has the following limitations:

  --Because of the small sample size, the data become more unreliable as they are disaggregated

  --National data are unreliable for occupations without significant employment

- Unemployment Insurance Data (ES-203 Report)--For the insured unemployed, data are collected on demographics, occupational and industrial attachment, and duration of unemployment. This source has the following limitations:

  --Unemployed persons with insufficient recent work experience are not covered

  --Data are based on a sample of unemployment insurance claimants

  --Eligibility laws vary among states, thus limiting the comparability of data

- Local Area Unemployment Statistics (LAUS)--Unemployment estimates for States and local areas are developed by State employment security agencies to measure local labor market imbalance and hence are a key indicator of local economic conditions. These estimates are used by State and local governments for planning and budgetary purposes and as an indication of the need for local employment and training services and programs. LAUS data have the following limitations:

  --There is no occupational detail in the LAUS program

  --Data are used for funds eligibility and allocation purposes and have limited direct applicability for use in an OIS.

4.2, 4.3 POPULATION AND ECONOMIC DATA

There are many other general categories of data such as population and economic information needed by planners and decision makers which complement strictly labor market demographics. These data include population, vital statistics, finances, income, wealth, and prices. To identify sources of such information, two additional general categories are added to the overall matrix: one for general population related data and one for general economic related data.

- Data Book, State of Hawaii (Department of Planning and Economic Development: DPED)--An annual statistical abstract on the social, economic, and political organization of the State and Counties including historical data.

- Facts and Figures, (DPED)--Summary brochures for the State and Counties separately with social, economic, and political data taken from the Data Book.

- Statistical Reports (The Population of Hawaii) (DPED)--Detailed current and historical data on population and its composition by State, County, and island. Issued quarterly.

- Long-Range Population and Economic Simulations and Projections (DPED)--Simulations of alternative growth patterns to the year 2000 with proposed projections by industry and demographics.

- DPED Newsletter--Brief summaries of current population, economic, and other statistical reports.

- Hawaii's Income Expenditure Accounts (DPED)--Gross State Product, household accounts (income/expenditures), savings/investments, government accounts (revenues/expenditures), and external accounts (receipts/payments of Rest-of-World/Hawaii).

EXHIBIT 3-5
DATA SOURCE MATRIX--COMPLEMENTARY INFORMATION

DATA CATEGORIES / DATA SOURCES		COMPLEMENTARY INFORMATION			
		WORKER AND LABOR MARKET DEMOGRAPHICS	OUTLOOK: SUPPLY/ DEMAND BALANCE	POPULATION	ECONOMY
CENSUS	A 2-3	●		●	●
CPS	A 7-8	●			
DEPARTMENTAL REPORTS				●	●
DLIR PUBLICATIONS		●	●		
HCIDS			●		
LAUS	A 20-21	●			
LMI PROGRAM	A 22-25	●			
STATE APPRENTICESHIP, UNIONS, ASSOCIATIONS	A 34	●			
UI DATA	A 39-40	●			

NOTES:

This matrix is intended to facilitate cross referencing to the appendices. Page numbers in the table correspond to the page numbers on the data source descriptions found in the appendices.

Data sources identified for each data category are not necessarily definitive or comprehensive.

5. SUPPLY/DEMAND INTERFACE

An interface and analysis of occupational supply and demand information is an essential component of an occupational information system. Treated separately, supply and demand data are useful but insufficient information as inputs for planning and counseling purposes. The analysis of occupational supply and demand is the most critical part of the occupational information needed by education and training program planners and counselors.

From the classical economist's viewpoint, the number of individuals available and willing to work in an occupation at a given wage (supply) affects an employer's decision to hire workers in that occupation. Similarly, the demand for workers at a given wage affects the number of individuals willing to enter an occupation. Many factors, economic and non-economic, complicate the study of the interaction of supply and demand for workers. Neither employers nor workers always behave in strict adherence to classical economic notions, nor have complete and accurate knowledge of the job market.

In an ideal situation, complete and consistent information on current and projected job openings and current and projected labor market entrants would be available to all users. This discussion assumes a condition exists that permits an analysis of the balances and imbalances between demand for and supply of workers. Comparisons of data on projected job openings and expected labor market entrants will result in one of three outcomes: a supply/demand balance (entrants equals openings), a shortage (entrants less than openings), or a surplus (entrants greater than openings).

Analysis of the results should focus on the reasons for the balance, surplus, or shortage. For example, does a shortage exist because earnings and working conditions are unattractive? Are education and training programs available or planned in occupational fields for which there appear to be an increasing demand? Are completers of specific education and training programs obtaining jobs in occupations related to their training? Such evaluations provide valuable information for planners, counselors, and career decision makers.

At the present time, all the data needed for calculating and comparing job openings and entrants are not available. Also, procedures for conducting such comparisons are not standardized. Therefore, supply/demand comparisons must be prepared using incomplete information, while at the same time striving to improve the required data and establish the necessary procedures. As a first step to develop the comparison, one must acquire an understanding of the various classification structures that are used to codify supply and demand data. (A detailed discussion of each is provided in Appendix B.)

5.1 CLASSIFICATION STRUCTURES RELATED TO OCCUPATIONAL DEMAND

Occupational demand data is usually available according to one of the following coding structures:

- Census Code--This coding structure was used to classify occupational data collected in the decennial census and the CPS. The 1970 Census data uses 441 occupational categories. The census scheme allows for cross-tabulating the data to 227 industrial categories. The 441 occupational categories have associated job titles, which are described in the 1971 Classified Index of Industries and Occupations and the Alphabetic Index of Occupations and Industries.

- Dictionary of Occupational Titles (DOT) Code--The first six digits of the nine-digit DOT code represent the type and level of work performed. The last three digits are used to differentiate an occupation from all others. DOT codes exist for the approximately 20,000 occupational titles listed in the Fourth Edition of the DOT.

- Occupational Employment Statistics (OES) Code--This coding structure contains approximately 1,700 occupational classifications. The classifications are presented in the OES Dictionary.

- Standard Occupational Classification (SOC) Code--This coding structure, recently developed by the Department of Commerce, is structured on four levels: division, major group, minor group, and unit group. Each level represents a finer level of detail, thus users are able to tabulate or analyze data at different levels of aggregation. The SOC contains approximately 660 occupational classifications which are cross referenced with DOT occupations in the Index to the Standard Occupational Classification Manual.

5.2 CLASSIFICATION STRUCTURES RELATED TO OCCUPATIONAL SUPPLY

The codes related to occupational demand can also at times apply to occupational supply (e.g., job applicants at local employment security offices are classified using the DOT). However, two additional codes are related specifically to occupational supply.

- U.S. Office of Education (USOE) Code (Handbook VI)*--This code is used to describe courses and programs in elementary, secondary, postsecondary, and adult schools as well as community colleges. The code contains 22 principal subject matter areas, programs, or curricula, several of which are concerned with vocational education.
- Higher Education General Information Survey (HEGIS)*--HEGIS codes represent distinct program fields, which may be either academic disciplines or occupational specialties. HEGIS codes are presented in A Taxonomy of Instructional Programs In Higher Education.

5.3 MATCHING OCCUPATIONAL SUPPLY AND DEMAND

For the purposes of the OIS, the process of analyzing occupational supply and demand differs from the traditional economic approach. In the OIS, demand data will provide information related to job opportunities in specific occupations for current and future time periods (usually one-year and five-year time horizons). The occupations, for which the job opportunities exist, will generally be categorized in accordance with one of the occupational classification structures described in Section 5.1 above. The process of analyzing occupational supply and demand data will involve "matching" the supply data pertaining to potential new labor market entrants with the occupational categories for which demand data exists. This matching process is complicated by the multiplicity of classification structures that are being used to classify data from the various sources of occupational supply. These classification structures

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*At present, NOICC, OE, and NCES are in the process of developing new, more comprehensive vocational program descriptors to be incorporated into the USOE codes. This effort will be combined with another project and result in a new taxonomy of instructional programs that will replace the current Handbook VI and HEGIS codes.

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include not only the occupational coding systems discussed in Section 5.1, but also the instructional discipline taxonomies presented in Section 5.2. Exhibit 3-6, on the following page, graphically depicts the sources of occupational demand data, occupational supply data, and the cross-code interrelationships that might be utilized in matching the occupational supply and demand data.

Currently there are two generally accepted approaches for matching occupational supply and demand. One approach is occupational clustering which involves grouping occupations by common skill requirements or work activities. Similarly, educational clusters are based on the skills taught as part of the course curriculum. Clustering allows homogeneous groups of occupations and educational courses to be matched. The second approach for matching occupational supply and demand data is to utilize direct code crosswalks. Direct code crosswalks are built upon the concept that specific interrelationships between the codes in different classification structures can be identified. Direct code crosswalks are necessary in the comparison of supply and demand data which have been codified utilizing the various classification structures described in Sections 5.1 and 5.2 above. The following direct code crosswalks, which are discussed in Appendix C, can be utilized in an OIS.*

.DOT-USOE (Source: Vocational Education and Occupations)

.Census-DOT-USOE (Sources: Matching Occupational Classifications to Vocational Program Codes, Tomorrow's Manpower Needs, Supplement 3 (Revised) and the California Cross-Code Index)

.Census-DOT-OES-USOE (Source: Vocational Preparation and Occupations--Occupational and Education Code Crosswalk)

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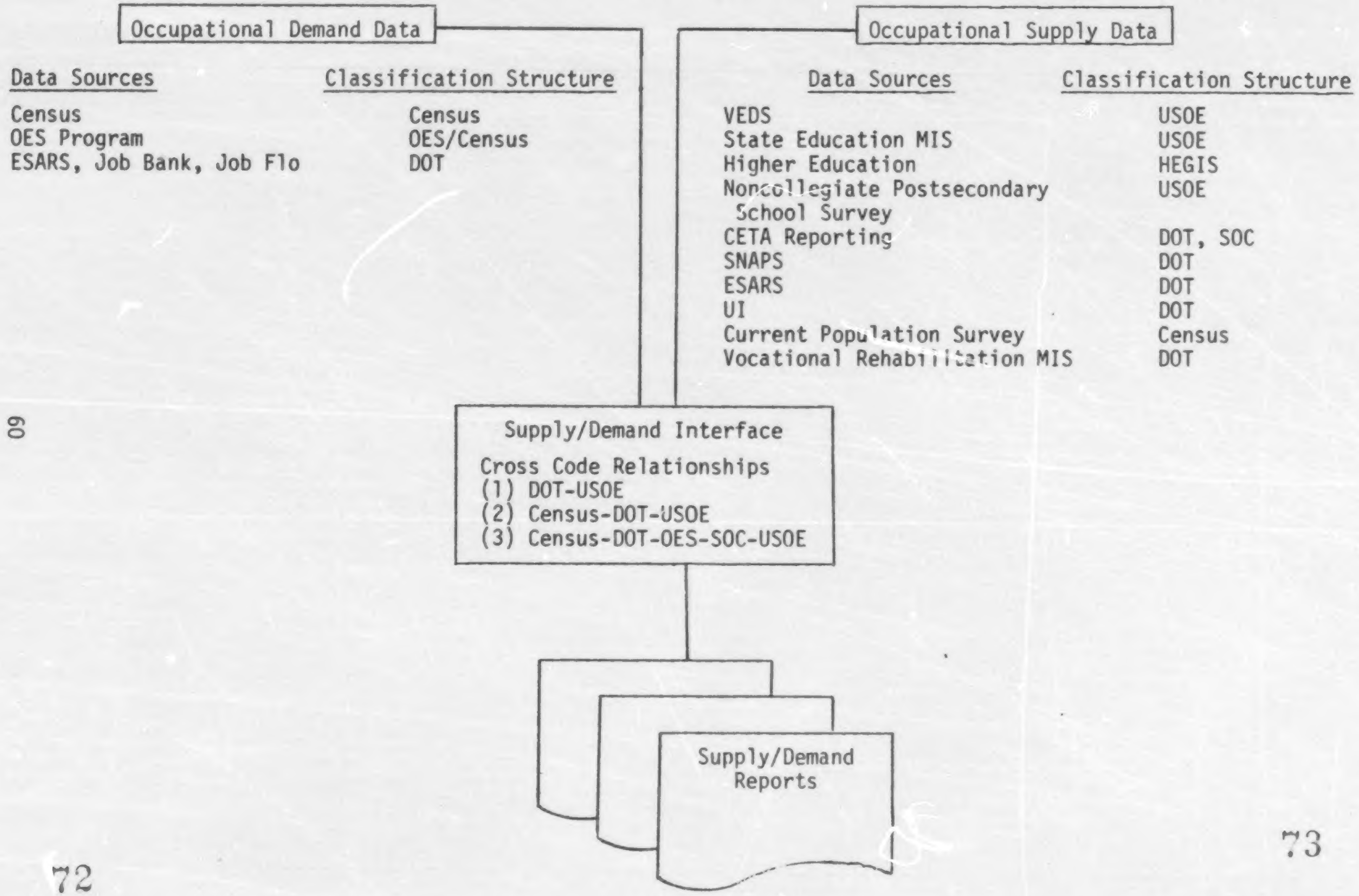
*In addition to the crosswalks listed above, BLS can provide listings or tapes of the following code crosswalk:
(1) OES-DOT-USOE
(2) OES-Census
(3) OES-DOT
(4) SOC-OES

EXHIBIT 3-6
MATCHING OCCUPATIONAL SUPPLY AND DEMAND



Occupational Demand Data

Data Sources	Classification Structure
Census	Census
OES Program	OES/Census
ESARS, Job Bank, Job Flo	DOT

Occupational Supply Data

Data Sources	Classification Structure
VEDS	USOE
State Education MIS	USOE
Higher Education	HEGIS
Noncollegiate Postsecondary School Survey	USOE
CETA Reporting	DOT, SOC
SNAPS	DOT
ESARS	DOT
UI	DOT
Current Population Survey	Census
Vocational Rehabilitation MIS	DOT

Supply/Demand Interface

Cross Code Relationships
(1) DOT-USOE
(2) Census-DOT-USOE
(3) Census-DOT-OES-SOC-USOE

Matching occupational supply and demand is further complicated because of the lack of standardized data on the various sources of occupational supply. For example, it is difficult to estimate the extent to which occupational or geographic mobility will affect the supply of workers for a specific occupation.

The end result of the process of matching occupational supply and demand data should be the production and publication of a series of supply/demand reports. These reports should be part of the LMI core product prepared for Vocational Education by the State Employment Security Agency. These reports should be formatted to present information in a clear, concise manner to users. The supply/demand reports should provide the necessary current and projected occupational information that administrators and planners need for planning purposes. The HSOICC, utilizing the resources of its member agencies, should coordinate and periodically review efforts between data users and data producers to develop the appropriate formats for the supply/demand reports. Such information will be dependent on availability of data within the state and to HSOICC.

5.4 USE OF SUPPLY/DEMAND ANALYSIS

Supply/demand analysis has widespread applications. Knowledge of future labor market conditions enables vocational education planners and administrators to identify programs that will have high student placement rates. CETA planners can also determine the occupations most suitable for their target populations based on shorter-term projections. State and local economic development specialists can use the data to respond to company representatives who are contemplating relocations in local areas. Supply/demand analysis is particularly important to counselors, career decision makers, and job seekers. Individuals should be aware of their likelihood of obtaining employment in an occupation, prior to investing substantial time and money in training, preparation, or job search activities.

6. MASTER DATA SOURCE MATRIX

Exhibit 3-7, on the following page, is a summary matrix that displays OIS data categories and data sources. This matrix incorporates the data source matrices for occupational demand, occupational supply, occupational characteristics, and complementary information.

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EXHIBIT 3-7
MASTER DATA SOURCE MATRIX

DATA CATEGORIES / DATA SOURCES		OCCUPATIONAL DEMAND					OCCUPATIONAL SUPPLY					OCCUPATIONAL CHARACTERISTICS AND PREPARATION													COMPLEMENTARY INFORMATION				
		CURRENT OCCUPA. DEMAND		PRO-JECTED OCCUPA. DEMAND																									
		CURRENT OCCUPATIONAL EMPLOYMENT	JOB OPENINGS	EXPANSION/REDUCTION DEMAND	REPLACEMENT DEMAND	EMPLOYMENT BY INDUSTRY	ENROLLMENT IN & COMPLETERS & LEAVERS FROM TRAINING/ EDUCATIONAL INSTITUTIONS	CURRENTLY UNEMPLOYED	LABOR MARKET NET MIGRATION	OCCUPATIONAL TRANSFERS	NEW ENTRANTS, RE-ENTRANTS TO THE LABOR FORCE	EARNINGS & BENEFITS	JOB DUTIES	WORK SETTINGS & CONDITIONS	ABILITY & APTITUDE	LICENSING, REGISTRATION, & CERTIFICATION REQUIREMENTS	EDUCATION/TRAINING SKILL ACQUISITION PATTERNS	EDUCATION/TRAINING REQUIREMENTS	CAREER LADDERS	MAJOR EMPLOYERS	HIRING CHANNELS	OCCUPATIONAL TITLES & DESCRIPTIONS	INVENTORY & DESCRIPTIONS OF EDUCATION & TRAINING PROGRAMS	FINANCIAL ASSISTANCE	LABOR FORCE DEMOGRAPHICS & TRENDS	OUTLOOK: SUPPLY/DEMAND BALANCE	DEMOGRAPHICS OF WORKERS BY OCCUPATION	POPULATION	ECONOMY
AREA WAGE SURVEYS	A 1, 17, 47											●																	
CENSUS	A 2-3	●			●				●	●		●										●			●		●	●	●
CES	A 4-5					●																							
CETA REPORTING	A 6						●																						
CPS	A 7-8									●															●		●		
DEPARTMENTAL REPORTS																												●	●
DLIR PUBLICATIONS		●	●	●	●	●						●	●			●				●	●	●			●	●			
DOT	A 9-11												●	●	●	●		●				●							
ESARS	A 12-13		●					●				●									●								
ESP	A 14-15				●						●																		
HCIDS		●	●	●							●	●	●	●	●	●	●	●	●		●	●	●	●		●			
HEGIS	A 16						●																●						
JOB BANK	A 18-19		●																										
JOB FLO	A 18-19		●																										
LAUS	A 20-21																								●				
LMI PROGRAM	A 22-25																								●				
NONCOLLEGIATE POSTSECONDARY SURVEY	A 26						●																●						
OCCUPATIONAL GUIDES & BROCHURES	A 32												●	●	●	●	●	●			●								
OE GRANTS & ASSISTANCE PROGRAMS																								●					
OES	A 28-31	●		●									●									●							
OOH	A 33											●	●	●	●	●	●	●	●										
OSHA														●															
SCHOOL CATALOGUES																							●	●					
SNAPS	A 35-36						●																●						
SOC	B 11-14																					●							
STATE APPRENTICESHIP AGENCIES, UNIONS, PROFESSIONAL ASSOCIATIONS	A 34											●							●								●		
STATE EDUCATION MIS	A 37						●																●						
TABLE OF WORKING LIFE-VITAL STATISTICS	A 38				●																								
UI DATA	A 39-40					●		●												●					●				
VEDS	A 41-44						●																●						
VOCATIONAL REHABILITATION	A 45-46						●																						

NOTES: This matrix is intended to facilitate cross referencing to the appendices. Page numbers in the table correspond to the page numbers on the data source descriptions found in the appendices.

Data sources identified for each data category are not necessarily definite or comprehensive.

DATA SOURCES

- CES = Current Employment Statistics
- CPS = Current Population Survey
- DOT = Dictionary of Occupational Titles
- ESARS = Employment Services Automated Reporting System
- ESP = Employment Services Potential Program
- HCIDS = Hawaii Career Information Delivery System
- HEGIS = Higher Education General Information System
- LAUS = Local Area Unemployment Statistics
- LMI = Labor Market Information
- MIS = Management Information Systems
- OES = Occupational Employment Statistics
- OOH = Occupational Outlook Handbook
- OSHA = Occupational Safety & Health Administration
- SNAPS = State & National Apprenticeship System
- SOC = Standard Occupational Classification
- UI = Unemployment Insurance
- VEDS = Vocational Education Data System

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IV. HSOICC OPERATIONAL STRATEGIES

The four operational alternatives for OIS development include:

(1) An Information Clearinghouse--HSOICC could satisfy the informational needs of users by collecting occupationally-related publications, pamphlets, or other materials and distributing/disseminating this information to requesting users. Potentially, these materials could satisfy the planning, career guidance, counseling, and job search occupational information needs of users. HSOICC does not necessarily need to physically maintain a document inventory. An information clearinghouse could also be created by establishing an index of available materials and developing a system for accessing individual items in the index using key words.

(2) Publication Producing OIS--This OIS operational alternative involves the synthesis of information and data from various programs, agencies, and data sources into one or a series of publications that are tailored to the needs of the various user populations that must be served. During the process of synthesizing the necessary information, an analytical function will be required. HSOICC staff will provide the necessary analytical capabilities to support the development of the publications. HSOICC should also seek agency participation in this effort. The publications generated in this process must satisfy the unmet occupational informational requirements of users and should not duplicate existing publications.

(3) A Network of Interrelated Programs and Systems--This OIS operational alternative may be appropriate to States having an existing Career Information Delivery System (CIDS). The CIDS will satisfy the career guidance, counseling, and job search information needs of users, and another program or system (possibly computer-based, possibly not) will be utilized to satisfy the occupational information requirements of vocational education and manpower training program planners and administrators (e.g., the Labor Market Information Program). These systems should be linked by the common usage of data sources in the development of information. The program or system utilized to support the planners and administrators could disseminate information through publications or computer terminals.

(4) A Comprehensive Computer-Based System--This OIS operational alternative will entail the development and maintenance of an occupational information data base that can provide comprehensive information for program planning, career guidance, counseling, and job search purposes. This data base would be accessible through computer terminals to various users. Data or information updates will be provided through participating agency programs and data collection efforts. The comprehensive computer-based OIS concept does not preclude the preparation and dissemination of appropriate publications.

The OIS operational alternatives described above represent a broad spectrum of processes and considerations such as staffing, funding, facilities, and

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programmatic organization (see Exhibit 4-1). The actual process or OIS operational alternative selected for implementation is complemented by certain Federal and State programs within Hawaii. Included among these programs are the Labor Market Information (LMI) program* conducted by the State Employment Security Agency (DLIR) and the Career Information Delivery System (CIDS) grants program. A brief overview of each program and the relevant occupational information associated with each program is presented in the following program descriptions:

.Labor Market Information (LMI) Program--Labor Market Information is defined in guidelines that are issued to Hawaii by ETA as

> ". . . that whole body of knowledge relating to labor force, employment, unemployment, wage, supply and demand, occupational, industrial, and economic and demographic information for the analysis of manpower problems."

As part of the LMI program, each State Employment Security Agency is required to produce certain core products each year. Two of these products, the Labor Market Information Newsletters and the Annual Planning Information, contain a wealth of labor force, employment, unemployment, and demographic statistics including some supporting analysis and discussion. In addition, employment developments by occupation and industry are covered in these products. Two other core products are specifically intended to satisfy the occupational information needs of CETA and vocational education planners. They are:

--Annual Occupational Analysis of Labor Supply and Demand (Occupational Information Program)--This product is intended to provide trends by industry and occupation and is also utilized in the preparation of related core products.

--Planning Information for Vocational Education--This product is designed for the vocational education system in developing long-range plans as prescribed in the Vocational Education Amendments of 1968 and 1976.

The LMI program can provide much of the information that is necessary in an OIS. However, funding constraints sometimes limit the preparation of core products within Hawaii.

.Career Information Delivery System (HCIDS) Program--The NOICC has been mandated to:

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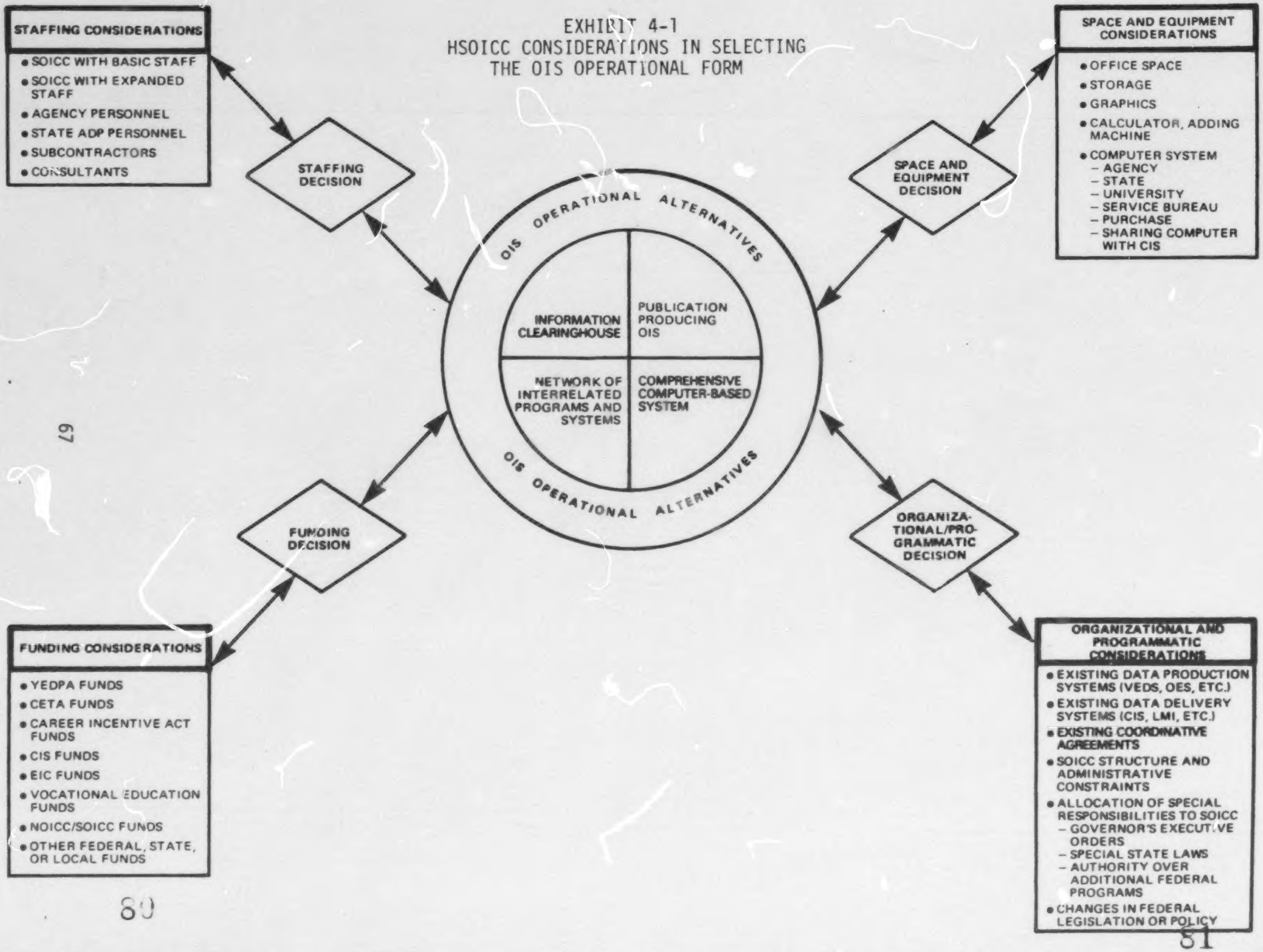
*For a more detailed discussion of the LMI program, refer to Appendix A.

> ". . . encourage States to develop career information systems to provide occupational, educational, and training information to persons who are in the process of career exploration and decision marking, especially students and out-of-school youth."

The eight States previously funded to develop a CIDS through this grant program are Alabama, Colorado, Massachusetts, Michigan, Minnesota, Ohio, Washington, and Wisconsin. Oregon was the pilot state for the CIDS program and now maintains an ongoing, self-supporting CIDS.

The informational content of these systems includes various files such as occupational files, occupational preparation files, education program files, training program files, financial aid and assistance files, and bibliographic files. Specific occupational information included in these various files include the nature of occupational duties; personal, educational, experiential, and legal requirements for entry; wages and fringe benefits; current employment and employment outlook, industries that use the occupations; opportunities for promotion and career advancement; hiring channels; working and environmental conditions; descriptions of education and training programs related to the occupations; and sources of additional information that can help with occupational exploration and planning. These systems have utilized a variety of media including computers, microfilm and microfiche, films, filmstrips, videotapes, and printed materials. The sources of information for the CIDS include many of the data sources or programs referenced in Chapter III and discussed in Appendix A. Among these sources are the Dictionary of Occupational Titles, the Occupational Outlook Handbook, the Occupational Outlook Quarterly, Occupational Guides and Brochures published by the SESA, the Job Bank Opening Summary, and selected ESARS tables.

EXHIBIT 4-1
HSOICC CONSIDERATIONS IN SELECTING THE OIS OPERATIONAL FORM


STAFFING CONSIDERATIONS
• SOICC WITH BASIC STAFF
• SOICC WITH EXPANDED STAFF
• AGENCY PERSONNEL
• STATE ADP PERSONNEL
• SUBCONTRACTORS
• CONSULTANTS
STAFFING DECISION
SPACE AND EQUIPMENT CONSIDERATIONS
• OFFICE SPACE
• STORAGE
• GRAPHICS
• CALCULATOR, ADDING MACHINE
• COMPUTER SYSTEM
– AGENCY
– STATE
– UNIVERSITY
– SERVICE BUREAU
– PURCHASE
– SHARING COMPUTER WITH CIS
SPACE AND EQUIPMENT DECISION
OIS OPERATIONAL ALTERNATIVES
INFORMATION CLEARINGHOUSE
PUBLICATION PRODUCING OIS
NETWORK OF INTERRELATED PROGRAMS AND SYSTEMS
COMPREHENSIVE COMPUTER-BASED SYSTEM
OIS OPERATIONAL ALTERNATIVES
FUNDING DECISION
ORGANIZATIONAL/PROGRAMMATIC DECISION
FUNDING CONSIDERATIONS
• YEDPA FUNDS
• CETA FUNDS
• CAREER INCENTIVE ACT FUNDS
• CIS FUNDS
• EIC FUNDS
• VOCATIONAL EDUCATION FUNDS
• NOICC/SOICC FUNDS
• OTHER FEDERAL, STATE, OR LOCAL FUNDS
ORGANIZATIONAL AND PROGRAMMATIC CONSIDERATIONS
• EXISTING DATA PRODUCTION SYSTEMS (VEDS, OES, ETC.)
• EXISTING DATA DELIVERY SYSTEMS (CIS, LMI, ETC.)
• EXISTING COORDINATIVE AGREEMENTS
• SOICC STRUCTURE AND ADMINISTRATIVE CONSTRAINTS
• ALLOCATION OF SPECIAL RESPONSIBILITIES TO SOICC
– GOVERNOR'S EXECUTIVE ORDERS
– SPECIAL STATE LAWS
– AUTHORITY OVER ADDITIONAL FEDERAL PROGRAMS
• CHANGES IN FEDERAL LEGISLATION OR POLICY

V. THE HAWAII CAREER INFORMATION DELIVERY SYSTEM (HCIDS)

Choosing a career and an occupation within a career is one of the most important decisions a person will ever have to make. Students, counselors, CETA participants, trainees, job searchers, and other components of the general public have important stakes in such decisions. In order to make the best career and occupational choice possible, individuals should have at their disposal all relevant career-related information. Unfortunately, this much-needed data is scattered throughout many sources and is often inaccessible to most individuals. A Hawaii career information delivery system was conceived to facilitate the crucial task of career decision making, choosing an occupation, and giving elemental assistance in seeking a job by youth, adults, trainees, CETA participants, and job searchers. It also helps teachers and counselors in education and guidance.

The need for coordinated linkages in planning, analysis, and delivery of occupational and educational information is recognized in Hawaii. Educational and training agencies, planners and researchers, guidance and placement counselors, as well as legislators and administrators have been concerned with bringing together fragmented sources. Through the co-sponsorship of HSOICC, public and private agencies have formed a Hawaii Career Information Delivery System (HCIDS) Steering Committee. The Committee has followed through on addressing solutions to these concerns and needs. The Committee is comprised of representatives of the major public educational and employment and training institutions and the private sector.

Because of the relevancy and widely expressed need for a "system" of occupational and career information, the HCIDS serves as a mechanism of much potential in bringing together in a close and coordinated manner, educational and employment and training agencies, through their participation in the development and implementation of an occupational information system.

Several sources document the need for a central, easily-accessible system of information that is up-to-date, complete, and linked with important related information. The HSOICC Survey of OI Users (August, 1978) identified the need for improved delivery of career and occupational information as a high priority. Follow-up workshops and surveys by HSOICC further refined this initial needs assessment and led to the published report Career Information as Part of an Occupational Information System: The Need for a Hawaii Career Information System, January, 1979. The HCIDS Steering Committee grew out of the January 17-19, 1979 Hawaii CIS Workshop and developed several important development documents which again substantiate the need for a comprehensive system.

1. HCIDS OBJECTIVES

The goal of the Hawaii Career Information Delivery System is to have a positive influence on the process by which people choose jobs and careers by providing them with current, accurate, and locally relevant occupationa, educational, training, and job information. The availability of such information will help individuals make a smoother trainsition from school to work or return to the labor force. Specific objectives are as follows:

1) to help youth and others learn about and understand the range of career opportunities presently available and that are likely to be available in the future;

2) to help entrants into the labor force become aware of occupations which they would find acceptable and personally satisfying;

3) to encourage persons in the process of career exploration and decisionmaking to seek out vocational information on their own;

4) to increase awareness of major sources of occupational information for the purpose of acquiring knowledge of occupations and training;

5) to help people learn of educational and training opportunities and their relationship to occupations that they may be exploring;

6) to provide support for related programs, including career education, career and employment counseling, and manpower and educational planning.

The following activities will achieve these objectives:

1) maintenance of a career information delivery system staff composed of a director and experts in the field of information development and dissemination services;

2) establishment of a policymaking board or consortium made up of representatives of key institutions representing both the users and producers of occupational and related career information.

3) maintenance of existing career information from a variety of sources for a wide range of potential users;

4) development of a continuously accessible delivery system to disseminate information to persons in the process of career exploration and decisionmaking;

5) provision of support to schools, manpower agencies, and other organizations using the system; and

6) provision of adequate training for both career information delivery system and user agency staffs.

2. HCIDS APPROACH

A consortium of public and private agencies and individuals in Hawaii have been working as a steering committee to bring a comprehensive and continuously up-to-date CIDS to Hawaii. People and programs that use career and occupational ifnormation have been surveyed and detailed needs have been assessed. Workshops and training sessions have been held with the cooperation of key agencies. Governor's Grant CETA Funds have been committed to get the system implemented. Initially, the HCIDS will be housed in the DLIR. Eventually, the system will have to be user-financed and self-sufficient.

3. HCIDS VEHICLE

The HCIDS uses a computer to store and retrieve information in several useful data files. A manual needlesort delivery method backs up the computer for use without a printing computer terminal. By typing in a few simple instructions on a terminal or by inserting a knitting-needle probe through notched cards, specific information is gotten in minutes. A self-inventory of interests and abilities helps organize the search for information. When the terminal is used, an individualized printout copy is made available. The system does not act as a counselor; it provides easily accessible, current, and reliable information which broadens awareness and provides more time for interpretation of interest, abilities, and information.

4. HCIDS DATA FILES

HCIDS includes the following information files:

Occupational Information. Includes occupational briefs on almost 90 percent of the jobs in Hawaii. Specific details include:

- .Occupational duties
- .Employment outlook
- .Training, education, and experience required
- .Wage information

Financial Aid Information. Includes public and private grants, scholarships, and other aid for postsecondary training and education. Specific information includes:

- .Type of aid
- .Application deadline
- .Major eligibility
- .Contacts for application

School and Training Information. Includes data from public and private vocational, technical schools and two- and four-year colleges and universities as well as employment and training programs.

- .Programs of study
- .Characteristics of the institution
- .Admission requirements
- .Tuition and fees
- .High school courses that will help in preparing for an occupation or career

Additional Information. Includes additional information useful in exploring occupations or in seeking employment. Specific information includes:

- .Career contacts, a list of people who will discuss careers and preparation
- .Other career resources which teachers or counselors would find helpful
- .Job opening summaries of jobs available at Employment Services Offices
- .Armed services occupational information

5. HCIDS ORGANIZATION STRUCTURE

Management policy setting for Hawaii's career information delivery system is located within HSOICC, that is, it is shared between DLIR (Office of Manpower Planning and Research and Statistics), Vocational Education, and Vocational Rehabilitation. Priorities, user needs, operational concerns, and similar functional areas are reviewed and evaluated by HSOICC's Executive Advisory Committee with technical assistance from subcommittees. (See Exhibit 5-1.)

The purpose of the advisory committee is to permit increased participation and input in an overall occupational information system and would include representatives from the State Commission on Manpower and Full Employment, the University of Hawaii, the Community College System, the Department of Education, CETA Prime Sponsors, the Department of Planning and Economic Development, businesses and unions, and others. The Committee advises HSOICC both on policy matters relating to fulfilling the NOICC/SOICC mandates in law and in technical assistance to facilitate the development of an OIS. The implementation of the initial HCIDS efforts is lodged in the Research and Statistics (R&S) Office of the Department of Labor and Industrial Relations (DLIR).

6. HCIDS ACTIVITIES

1. Information Development

   a. Attribute Coding: Attribute coding of all occupations for self-inventory questionnaire response must be based on empirical data. Six of the questions require local data.

   b. New Occupational Description Data Sources: Procedures and components of an occupational description for inclusion in the System must be developed.

   c. Maintain Occupational Files: Some topics and files require localization and local maintenance. Certain consistency checks must be made between files (e.g., between wages in DESC and ATTR).

   d. Adding or Deleting Occupations: Adding an occupation requires changes, additions, or cross-references in six or more places, besides writing the information.

   e. Collecting School Data: The School file requires compilation of data from various standardized reports supplemented by data from schools.

   f. Categorizing and Researching Programs of Study: Individual educational programs must be appropriately integrated into the PROG file and the entries must contain certain standardized data.

   g. Format Files: Most file formats are technically flexible but ATTR, PROG, and SCH have certain specifications. In addition, experience has shown that certain file organizations are easier to prepare and/or more useful to users.

   h. Carrying Out Information Development Workplans.

   i. Contacts with Data Sources: The identification and use of non-traditional information sources and development of a plan for maintaining contact with important sources can be arranged as part of the full package.

   j. Information Development Management: Setting up information development activities to manage effectively the systematic review of files along with special projects; review cycles; current updates; data loading, etc.

   k. Establishing and Maintaining a System Library: Implementing a library system that will enhance the usability of the mass of data sources collected for use in information file maintenance.

2. User Services: Effective marketing, training, troubleshooting, and user access for successful implementation.

   a. Marketing: Identifying potential users, insure effective demonstrations, writing service agreements, and establishing continuing financial support of the System.

   b. In-service Training: In-service training for users in various settings is essential, along with follow-up communications, on-site evaluation, and troubleshooting problems.

   c. Materials Distribution: Distribution methods for getting materials to users.

   d. Communications with User Staffs: A career information delivery system needs effective communication with user staffs via newsletters, user surveys, etc.

3. Operations Review and Management

   a. Review and analysis of LMI operations to determine

      1) the most appropriate integration of LMI (including OES) with the proposed CIDS

      2) most cost efficient use of existing hardware in accommodating the requirements of the proposal

   b. Financial Structure: Setting up the financial structure (e.g., first year's budget, revenue accounting, etc.) of the new organization.

   c. Printing: Estimating printing costs and procedures for materials production.

   d. Office Procedures: Consultation with management staff on general office procedures and practices.

   e. Computer Management: Consultation on management procedures and policies for operation on multiple computers operated by other organizations.

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EXHIBIT 5-1
HCIDS ORGANIZATION STRUCTURE

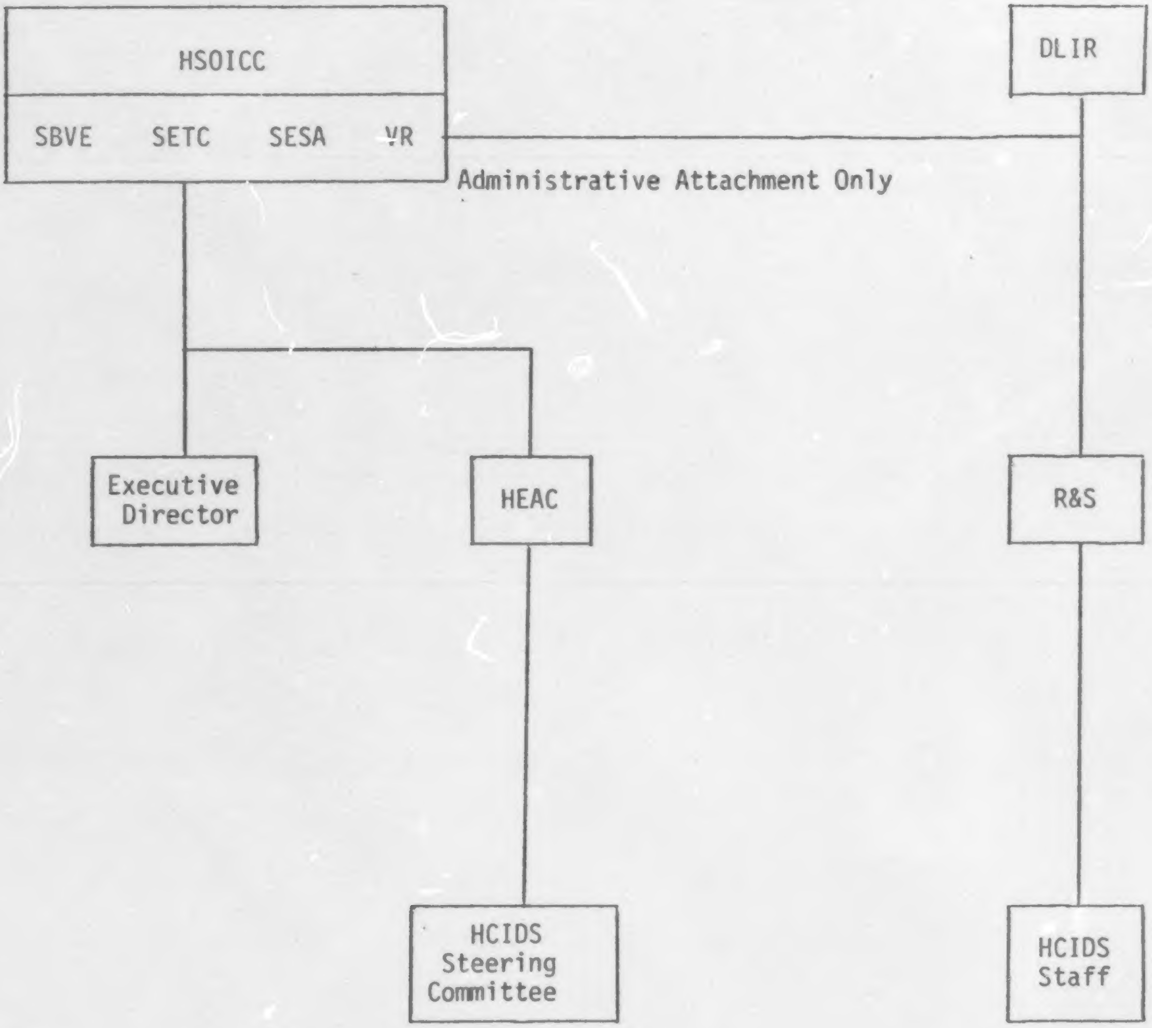
HSOICC
SBVE
SETC
SESA
VR
DLIR
Administrative Attachment Only
Executive Director
HEAC
R&S
HCIDS Steering Committee
HCIDS Staff

EXHIBIT 5-2

HAWAII STATE OCCUPATIONAL INFORMATION COORDINATING COMMITTEE

HAWAII CAREER INFORMATION DELIVERY SYSTEM STEERING COMMITTEE

Membership

Ms Sybil Kyi
Chairperson
Office of the State Director
for Vocational Education

Mr. Patrick Stanley
Vice-Chairperson
Hawaii State Occupational
Information Coordinating Committee

Dr. Edward Colozzi
University of Hawaii Community
Colleges
Leeward Community College

Dr. Peter Dyer
Educational Information Center
Project

Dr. Fred Haehnlen
University of Hawaii
Counseling and Guidance

Mr. Toshio Hagiwara
State Department of Labor and
Industrial Relations
Apprenticeship Division

Ms. Naomi Harada
Department of Labor and Industrial
Relations
Research and Statistics Office

Ms. Haruko Kaihara
Department of Social Services and
Housing

Dr. Edward Kaneshige
University of Hawaii
Counseling and Testing Center

Ms. Amanda Kautz
Commission on Manpower and Full
Employment

Ms. Cherlyn Logan
Unions--AFL-CIO

Mr. John McMillan
National Alliance of Businessmen

Mr. Bruce Shimomoto/Mr. Kerry Cloward
Private Schools
Chaminade University

Ms. Joanne Swearingen
Department of Education

Mr. Rob Zimmerman
Office of Human Resources
City and County of Honolulu

THE HAWAIi OCCUPATIONAL INFORMATION SYSTEM

VOLUME II:
National Data Source and and Classification Structures

VOLUME II

HSOICC

HAWAII STATE OCCUPATIONAL INFORMATION COORDINATING COMMITTEE

THE HAWAII OCCUPATIONAL INFORMATION SYSTEM
VOLUME II

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APPENDIX B: OCCUPATIONAL, INDUSTRIAL, AND INSTRUCTIONAL CLASS CLASSIFICATION STRUCTURES B-1

APPENDIX C: CROSS CODE REFERENCES C-1

BIBLIOGRAPHY D-1

REFERENCE TABLE FOR APPENDIX A

AGENCY PROGRAMS AND OTHER DATA SOURCES RELEVANT TO THE OIS

Data Source	Page
BLS Area Wage Surveys	A-1
Census	A-2, 3
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CETA Reporting	A-6
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DATA SOURCE: BLS Area Wage Surveys

Description:

This is an annual survey which provides data for occupations common to a wide variety of industries in 70 SMSA's throughout the Nation. The 76 occupational category studies include 29 for office clerical; 17 for electronic data processing, drafting and industrial nurses; and 30 for maintenance, toolroom, power plant and custodial and material movement jobs. Thus, they provide a representation of the range of duties and responsibilities associated with white-collar, skilled maintenance trades and other "indirect" manual jobs. Weekly salaries reported for individuals in white-collar jobs relate to regular straight-time salaries that are paid for standard workweeks. Average hourly earnings for maintenance and other manual jobs relate to first shift hourly rates.

Industry divisions covered are (1) manufacturing; (2) transportation, communication and other public utilities; (3) wholesale trade; (4) retail trade; (5) finance, insurance and real estate; and (6) selected service industries. Any establishment employing fewer than 50 workers is excluded from the sample. In the 13 largest communities, only firms in manufacturing, transportation, communication, other public utilities, and retail trade--and with a minimum of 100 workers, are included.

In addition to the all-industry averages and distributions of workers by earnings classes, separate data are provided for manufacturing and nonmanufacturing in each area, and wherever possible, for individual industry divisions in the nonmanufacturing sector. Separate data were provided for transportation, communication and other public utilities in 68 areas of the 70 in 1976; for retail trade in 32 areas; for wholesale trade and finance, insurance, and real estate in 18 areas; and for the selected service industries in 20 of the largest areas. In 31 of the larger areas, wage data are presented separately for establishments that have 500 workers or more.

Data on weekly work schedules, paid holiday and vacation practices, and health, insurance and retirement benefits are recorded separately for nonsupervisory office workers and plant workers (nonoffice). Shift operations and differentials are collected for plant workers in manufacturing. Data on minimum entrance rates for inexperienced office workers are collected in all industries. These items are studied every 3 years in all areas. This survey program also has developed information on profit-sharing plans, characteristics of sick leave plans, wage payment systems and other items related to employee compensation.

Limitations:

- Only limited geographic areas of the nation are covered.
- The surveys are limited as to the number and types of occupations which they include.

OIS Application(s):

Characteristics: May be used to provide data on wages for specific occupations

Technical References:

AWS Bulletin 1950 Series, U.S. Department of Labor, BLS.

DATA SOURCE: Census

Description:

The Census is a series of reports presenting statistics on the population and its general characteristics including race, sex, age, household and family characteristics, marital status, etc. for the nation, the 50 states, and the territories. The series consists of 58 "parts", issued, as of 1980, every five years and is based on a census or "head-count" survey of households in the United States and its territories. Some other occupational characteristics are collected by sample. The survey is usually conducted the second week of April. Detailed data are presented covering general social and economic characteristics such as nativity, disability, work status, school enrollment/ attachment, occupation, and income. Also covered are housing characteristics. Data are shown by States, counties, cities, blocks, and census tracts. Available to meet needs of census users are computer tapes which provide data in greater detail than is feasible to publish in printed reports. Six of these tapes are usually available on magnetic computer tapes, printouts, and microfilm at the cost of preparing the copy.

Limitations:

- Census information is not timely; data are approximately three years old when published.
- Data refer to place of residence; therefore, employment data may not agree with OES information which is based on place of work.
- Sampling error is high.
- Occupational titles are supplied by the interviewee and thus are subject to error and inaccuracies.
- Definitions are not provided for occupational titles.
- Occupational titles must be translated to Census occupational classifications and may be improperly coded.
- Some data are based on sample, and are subject to self assessment errors.
- Items reported may be changed from census to census so that definitions and coverage are not always comparable.
- Census occupational titles cannot be easily related to other occupational classification structures.
- Certain census data are based on samples too small to produce reliable estimates for specific geographical areas.
- Individuals who hold multiple jobs are counted only once.
- Census Occupational Classifications provide inadequate occupational detail for certain applications.

- Self-reported earnings may be misstated.

- Census earnings data are outdated and should be used only to compare levels of earnings across occupations.

- Occupational mobility data will not be collected in the 1980 Census.

- Data have limited use in calculating net mobility rates for occupations.

OIS Application(s):

Demand: Provides the basis for a matrix approach to demand projections when OES survey data are not available. The Census provides data on occupational employment levels. Census data can be used in analyses of the impact of occupational and geographic mobility on replacement demand.

Supply: Can be used in analyses of the impact of occupational and geographic mobility on labor supply.

Characteristics: Provides extensive detail on characteristics of the persons working in specific occupations.

Complementary: Is the most comprehensive source of demographic data on the population of the United States.

Technical References:

Alphabetic Index Of Industries And Occupations, Bureau of the Census, 1971

1971 Classified Index Of Industries And Occupations, September, 1971, U.S. Department of Commerce, Bureau of the Census

U.S. Census Of Population And Housing, Publications Distribution Section, Bureau of the Census, Washington, D.C. 20233; 1970

DATA SOURCE: Current Employment Statistics (CES) Program (BLS 790)

Description:

The Bureau of Labor Statistics cooperates in collecting data each month on employment, hours, and earnings from a sample of establishments in all nonagricultural activities including government. In 1975, this sample included over 160,000 reporting units. From these data a large number of series on employment, hours, and earnings in considerable industry detail are prepared and published monthly for the United States as a whole, for each of the 50 States and the District of Columbia, and for most of the metropolitan areas. The data include series on total employment, production or nonsupervisory worker employment, women employed, average hourly earnings, average weekly hours, and average weekly overtime hours (in manufacturing). For many series, seasonally adjusted data also are published.

In the collection of data on employment, payrolls, and hours, the BLS usually requests separate reports by establishment. However, when a company has more than one establishment engaged in the same activity in a geographic area, these establishments may be covered by a combined report.

Industry employment statistics published by BLS and the cooperating State agencies represent the total number of persons employed either full-time or part-time in nonagricultural establishments during a specified payroll period. In general, data refer to persons who worked during, or received pay for, any part of the pay period that includes the 12th of the month. However, at the national level, data for Federal Government establishments generally refer to civilian personnel who worked on, or received pay for, the last day of the month, plus intermittent employees who worked any time during the month (e.g., Christmas temporary employees of the postal service).

The primary collection of the current sample data is conducted by State agencies which have cooperative agreements with the BLS. In most States, this is the employment security agency, affiliated with the Employment and Training Administration, the organization which administers the State unemployment insurance program. In a few cases the State department of labor acts as the agency. The agencies mail schedules to a sample of establishments in the States each month. A "shuttle" schedule is used (BLS form 790 series); that is, one which is submitted each month in the calendar year by the respondent, edited by the State agency, and returned to the respondent for use again the following month. The State agency uses the information provided on the forms to develop State and area estimates of employment, hours, and earnings.

All national, State, and area employment, hours, and earnings series data are classified in accordance with the Standard Industrial Classification Manual. The program produces several tables that are released in various BLS publications including:

- Employment And Earnings, United States
- Employment And Earnings, States And Areas
- Monthly Labor Review

In addition, the data are disseminated through the publications of other Federal agencies including the Department of Commerce, the Federal Reserve System, and the Council of Economic Advisors.

Limitations:

- No occupational detail is provided, only industry employment figures.
- CES data are not directly comparable with ES-202 data because of differences in coverage; however, over time the trends are similar.
- There are some gaps in the local area coverage of the data.

OIS Application(s):

Demand: The CES provides employment data by industry.

Technical References:

BLS Handbook Of Methods, Chapter 3--Employment, Hours, and Earnings

DATA SOURCE: CETA Reporting

Description:

Currently CETA prime sponsors are required to report training activities by mode of training and length of program--not by field of study. New legislation, however, will require prime sponsors to give information on "enrollments, completions, job placements, and training related placements by detailed occupational or training code for classroom and on-the-job training programs." The required reports include a preapplication, master plan, annual plan, funding and financial analysis and participant records. The annual plan and reporting forms are mandatory. No awards may be made unless a completed annual plan application has been received. The regulations are in the process of being written. "Code" means any occupational or training code equivalent in detail to the SOC at the four-digit level.

It should be noted that about 20 percent of prime sponsors currently have automated management information systems capable of producing data to contribute to an OIS. Availability must be negotiated between the prime sponsor and the SOICC.

Limitations:

- Current ETA, DOL Quarterly Summary Of Participant Characteristics reports do not provide sufficient occupational detail.
- Data avilability and level of detail vary among prime sponsors.
- Reporting systems are not comparable among prime sponsors.
- Data may be duplicated in ESARS school enrollment reports.

OIS Application(s):

Supply: CETA reports under the new regulation will describe training activities by target occupation.

Technical References:

The Comprehensive Employment And Training Act Amendments of 1978, Forms Preparation Handbook, draft

ETA Handbook No. 311, ETA-DOL, February, 1979

Public Law 95-524, October 27, 1978, "Comprehensive Employment and Training Act Amendments of 1978."

DATA SOURCE: Current Population Survey (CPS)

Description:

The CPS is a sample survey of 55,000 households throughout the country. Data are collected monthly by the Bureau of the Census. Respondents in the sample are interviewed to obtain information on the labor force status of each household member aged 16 or over. National data are released monthly by the Bureau of Labor Statistics (BLS) as part of the current employment situation report. More detailed (averages) data are available annually. Special reports (Current Population Reports, Special Labor Force Reports) are issued periodically by the Census and BLS covering such topics as special groups in the labor force, and educational attainment. Data are published covering State and local areas on a more limited basis by BLS and Census.

The CPS provides detail on the economic and social characteristics of the population. It is the only source of data on the civilian noninstitutional population which is released on a regularly updated basis. It identifies persons who are in the labor force--either working (employed) or looking for work (unemployed)--and those who are not in the labor force. The CPS is a comprehensive current source of information on the personal characteristics such as age, sex, race, national origin, educational attainment, marital and family status. It provides distributions of workers by the number of hours worked and the occupations and industries in which they work. Data are published separately for metropolitan and non-metropolitan areas.

Since the early 1960's four studies of occupational mobility have been conducted through the monthly Current Population Survey. Data are tabulated for the Nation as a whole only and the published data must be retabulated for use in detailed supply analysis. The data show retention of workers in specific occupations from one year to the next. For example, data are available showing that 85 percent of all engineers remain engineers in the following year. Data also show the proportion of workers moving to other occupations and out of the labor force. Deaths are not accounted for because those who died during the past year are not in the current survey.

Occupational data are classified according to the structure used in the previous Decennial Census. In 1981 the data series will be shifted to the occupational structure to be used in the 1980 Census, which will be the Standard Occupational Classification, with some minor modifications.

Limitations:

- Data become more unreliable as they are disaggregated because of the small sample size.
- National data are unreliable for occupations without significant employment.
- The sample size is generally too small to permit accurate estimates of migration rates by occupation.
- Data from the CPS should generally be used to measure aggregate labor force activity rather than occupational and industrial employment for which better sources of data are available--the OES Survey for occupational employment and the Current Employment Statistics CBLS-790 data for industry employment.

OIS Application(s):

Supply: Can be used to analyze labor market migration and occupational transfers on a National level.

Characteristics: Provides demographic data on workers in specific occupations.

Complementary: Provides demographic data on the labor market population.

Technical References:

Bureau Of Labor Statistics Handbook Of Methods For Surveys And Studies--Bulletin 1910, 1976, BLS, Chapters 1, 2, and 8

The Current Population Survey, Design And Methodology, Technical Paper No. 40, U.S. Department of Commerce, Bureau of Census

DATA SOURCE: Dictionary Of Occupational Titles (DOT)

Description:

(1) Background

Dictionary Of Occupational Titles (DOT) provides specific information about job requirements and organizes occupations into useful job families based on job technology and requirements. The DOT systematizes information on 21,741 different occupations. For each occupation the DOT describes typical work duties, knowledge and skills involved in performing jobs, and the general abilities and tolerances required of workers.

Originally established following the depression, based on the public employment service system's need for a comprehensive body of standardized occupational information and modeled after the British Dictionary Of Occupations, the first edition of the Dictionary Of Occupational Titles was published in 1939. Established by the Wagner-Peyser Act and assigned its primary mission of equitably and efficiently matching workers with jobs, the employment service required a uniform occupational language in all of its offices. Since its initial distribution, the Dictionary Of Occupational Titles has provided a standardized and systematically organized body of occupational information designed to assist in matching jobs and workers.

Central among the underlying assumptions on which the DOT is based are the ideas that: (1) work is organized in a variety of identifiable ways; and, (2) while every job in the U.S. economy is similar to a number of other jobs, every job is performed slightly differently from any other job. More than a decade of extensive nationwide research and verification form the nucleus of data in the new fourth edition of the DOT.

(2) 4th Edition

Based on an extensive occupational research program operated through the federal-State employment services system, Job Services, the fourth edition provides accurate, up-to-date descriptions for most occupations in the American economy. Such timely and accurate information is essential for job placement programs, the operation of employment counseling and career guidance programs, and as a base for the development of imaginative employment program planning and training programs. It contains the most comprehensive up-to-date occupational information on American job duties and requirements ever assembled in a single volume. Each occupational definition in the fourth edition is written in simple and concise language. A number of new features broaden and strengthen the data base, expanding information on the characteristics of jobs and the world of work. As were its predecessors, the fourth edition will be very useful to users of occupational information in the public and private sectors including but not limited to those in trade unions, professional organizations, school counselors, and educational and industrial personnel directors. The fourth edition reflects the sweeping technological changes that have taken place during the dozen years since the third edition was published.

Material in the new edition is based on extensive on-site analysis of the spectrum of jobs in the U.S. economy conducted by the Department of Labor Employment and Training Administration and affiliated State employment services. These analyses helped identify and define new jobs and verify existing occupational definitions or revise them to reflect current industrial practices.

Briefly stated, the fourth edition is a single volume dictionary which:

- Focuses on occupational classifications and definitions for nearly all jobs in the U.S. economy
- Contains comprehensive descriptions of duties and job-related information for more than 20,000 occupations
- Groups occupations into a systematic classification structure based on interrelationships of job tasks and worker requirements
- Is designed as a placement tool to facilitate matching job requirements and worker skills

Chief among new features in the fourth edition are the following:

- Complete revision of the 1965 edition; reflects the impact of changing technology on the occupational structure of U.S. industry.
- New format; occupational definitions are arranged on a basis of job relationships.
- Unique nine-digit code numbers are assigned to each occupation.
- Significant military occupations are included for the first time.
- Materials suggesting occupational limitations based on sex or age have been eliminated.
- Occupational definitions have been updated or verified; more detailed occupational information is included.
- Over 2,100 new occupations have been added, and 3,500 obsolete titles deleted.

One visible change is the condensation of the two volumes of the third edition into a single volume in the fourth. While the materials on worker traits and areas of work have been eliminated from the DOT, they will be issued as supplements to the fourth edition in a publication entitled Guide To Occupational Exploration. This guide, in addition to an occupational interest inventory oriented to the fourth edition, holds promise for expansive use of the DOT, especially by career and educational counselors.

Also available are the DOT data display tapes available from ETA. The tape is a computer listing of DOT codes and titles showing 3rd and 4th edition DOT codes, and General Education Development (GED), Specific Vocational Preparation (SVP) and physical traits requirements for each occupational title. Just recently published is Conversion Table Of Code And Title Change - 3rd To 4th Edition, Dictionary Of Occupational Titles, available from DOL at $6.00 per copy. 101

Limitations:

- Although more than 20,000 job titles are given, the DOT still does not cover all jobs in the U.S. economy.
- The number of job titles may hinder their use in career developments and planning activities.
- Definitions are composites and general, and may not be applicable at a local level.
- It does not contain any data relating to employment trends or job potential.

OIS Application(s):

Characteristics: Provides substantial information on the characteristics of specific occupations

Supply/Demand Interface: Provides a nationally accepted occupational classification system. Permits computerized aggregation of job openings, vacancies, workers, trainees, etc. by occupational category at definitive levels.

Technical References:

Dictionary Of Occupational Titles, Fourth Edition, U.S. Department of Labor, USGPO

DOT Data Display Tape; Employment Training Administration, Division of Occupational Analysis

DATA SOURCE: Employment Service Automated Reporting System (ESARS)

Description:

ESARS is a computerized reporting system in the Employment Security agencies which tabulates and cross tabulates operational transactions as they occur at the field office level. Transactions refer to activities such as new applications, renewals, counseling, testing, placement, openings received or cancelled, etc. ESARS also includes statistics on the individuals served by the field offices and provides a large number of characteristic elements including sex, age, ethnic group, occupational attachment, income, welfare and/or claimant status, veteran status, handicap, educational attainment, family status, etc. The report contains information on job openings serviced through the field offices and shows occupation, offered wage, industry, and expected duration.

ESARS tables are primarily concerned with providing cumulative data on individuals. The tables cross-classify services to individuals with the characteristics of those individuals. For example, all the characteristics, age, sex, etc., are available for each individual served through transactions such as testing, placement, and referral. An "individual served" type cell (data element) in ESARS will give an unduplicated count of total individuals who received a given category of service as defined by the cell. For example, an individual would be counted only once as tested regardless of how many times he was tested during a given fiscal year. In ESARS, characteristics of all active individuals are carried over from one fiscal year to another.

In ESARS, activity is reported by fiscal year, rather than calendar year. The term "year-to-date" refers to the fiscal year. All characteristics of Active Applicants in the Automatic Data Processing (ADP)--Applicant Master File at the beginning of the fiscal year are maintained for each such application throughout the year. Changes in status with respect to WIN, Food Stamp, Eligible Claimant, CETA, and Economically Disadvantaged characteristics are recorded as they occur. The time period covered by each table is recorded at the bottom of every printout.

ESARS Table 96 is especially important to an OIS because it is an occupation-specific table. It concerns applicants and nonagricultural job openings by occupation and is produced statewide and by local office. Table 96 is monthly, year-to-date. Total fully registered applicants available (i.e., applicants active at any time during the current fiscal year) are sorted by DOT code in ascending order. In addition, all nonagricultural unfilled job openings as of September 30 plus openings received during the current period are also sorted by DOT in ascending order. Next, the first three digits of the DOT codes are used to compile the "three-digit summary code" column in Table 96. Data on all applicants and/or job orders with identical three-digit summary codes are then used to generate on-line on Table 96. For example, codes 001.012-418, 001.034-182, 001.046, 001.091 and 001.099 would be included and used to generate the total code 001.

In addition to the three-digit summaries, a number of selected six- and nine-digit code totals are interspersed in the table immediately following the three-digit total in which it is counted.

Limitations:

- Data reflects only job openings reported to ES local officer (research indicates that these openings represent a relatively small share of total job vacancies)

- Data are limited to statistics collected for management purposes, not for labor market information.
- Data are limited to applicants flowing through ES field offices.
- Most studies show that wages reflected in ESARS are in the bottom quartile of wages and salaries paid in the occupations represented.
- Occupational coding detail is sometimes inconsistent (i.e., two-, six- and nine-digit DOT codes are used)
- Procedures for assigning a DOT code to a specific job opening vary among Employment Security local offices.

OIS Application(s):

Demand: Shows job openings at local level by occupation, wages, duration, etc.

Supply: Previous data on job applicants.

Characteristics: Provides wage information from job orders

Technical References:

ESARS Tables Interpreted "A Users Guide", South Carolina Employment Security Commission, Manpower Research and Analysis, January, 1979

ETA Handbook No. 309, (ESARS), ETA-DOL

DATA SOURCE: Employment Service Potential (ESP)

Description:

Historically, one of the key variables missing in labor market research, and especially that dealing with the U.S. Employment Service (ES), has been a quantifiable estimate of the total hiring activity taking place within a labor market area. In the absence of such a figure, researchers have utilized the available measures of labor market activity such as the level of employment or the unemployment rate as gauges of economic forces.

Even in the absence of overall estimates of hiring activity, it has been recognized that such a measure, while pertinent to broader analysis, is too encompassing for the ES per se. Practitioners have long recognized that a number of hiring transactions are outside of the reach of the ES. Examples of such hires would include those via union hiring halls or other such restricted placement concerns, rehires, etc. In essence, for quantitative estimates of hiring activity to be relevant to ES, they must be redefined to include only those in which the ES has some possibility of participating.

The concept, as it is redefined above, is of considerable importance in that it summarizes all of the economic and labor market forces impacting an ES in a single figure. The absence of such information has undoubtedly impaired the ES in both its day-to-day operations, and in attempts to improve its services through experimental designs.

The basic intent of the ESP methodology is to develop quantifiable estimates of the total number of hiring transactions within a given time frame in which ES had some possibility of participating. Essentially, this calls for (1) determining the total number of hiring transactions by major industy (i.e., mining, construction, etc.) within each local office area, and (2) adjusting these counts to reflect the various institutional and structural factors in each respective area precluding ES involvement.

The first step in this process is accomplished by using the records of the Unemployment Insurance Service. These records contain, for every employer covered under the program, quarterly documentation on each employee by employer containing social security number, name, total wages paid, and that portion of total wages subject to the UI tax. To produce counts of total hiring activity for a given quarter, a computer program was written which compares, by individual employer, all social security numbers occurring in the current quarter with the corresponding record for the immediately preceding quarter. By definition, any social security number occurring in the current quarter but not in the immediately preceding one, was counted as a hire. These counts were in turn aggregated by industry and local office area to produce total hiring activity counts.

These counts of hiring transactions must be adjusted to reflect the various institutional and structural factors precluding ES involvement in the hiring process. Two major institutional and structural factors can be readily identified: (1) hires via union hiring halls and (2) rehires. To develop estimates of ES potential, the unionization and rehire factors must be applied to annualized industry estimates of new hires by local office area.

Another indicator that is important in the Employment Service Potential (ESP) program is the measure of Employment Service penetration. This indicator can be derived by comparing job placements data by industry from ESARS to the new hires information calculated by the analysis of Unemployment Insurance records. This comparison is complicated in that ESARS data can be based on either individual or transaction counts. However, the data can be used to derive a rough estimate of Employment Service penetration.

Limitations:

- Data are 5 to 6 months old when available.
- Data are available for a limited group of states (only 18).
- Occupational specific data are not available.
- Wage record data are available only by company, not establishment and not necessarily by job location.
- Data for large companies are apparently less valid than for smaller (under 250 employee) firms.
- The ESP methodology does not apply in the thirteen wage request states that do not require employers to report employees' earnings quarterly.

OIS Application(s):

Demand: The ESP program provides indicators of worker replacements and net employment gains or losses

Supply: The ESP program provides rough measures of new hires to a firm which may be new entrants or reentrants to the labor force

Technical References:

ESP - A New Source Of Labor Market Information, Dr. M.S. Cohen, July, 1978. Paper prepared for National Commission on Employment and Unemployment Statistics and the Department of Labor

Nevada Employment Service Potential Project, James Hanna, Nevada Employment Security Department, December 1976

Series of Methodology Papers, Employment Data and Research Section, California Employment Development Department, 1977-78

DATA SOURCE: Higher Education General Information Survey (HEGIS)

Description:

The Higher Education General Information Survey (HEGIS) is a series of annual and periodic data collection instruments administered by the National Center for Education Statistics. This survey has been adopted by NOICC as a principal source of data for the OIS. HEGIS encompasses the universe of accredited public and private colleges and universities that grant Associate Degrees or higher. In addition, a limited number of proprietary schools are included. Enrollment data by level of study, but not by field of study, and data on degrees conferred, by level and field of study are collected. Data are available on computer tape at the institution level and can be aggregated to any desired geographic area.

The HEGIS taxonomy has been unique. For upper-level programs it has been generally considered sufficiently detailed for planning purposes. For lower-level programs the codes (5000 series) have been criticized as being too broad, and are expected to be revised to correspond with the proposed VEDS taxonomy.

Limitations:

- The HEGIS taxonomy is unique and has limited detail; however, plans call for modifications to increase comparability with the proposed VEDS taxonomy.
- The 5000 series code overlaps with category 16, Technical Education, in Handbook 6.
- No definitions are provided except at the group level.
- Limited follow-up studies are conducted.
- There is a lack of awareness of unpublished data that are only available on computer tapes or microfiche.
- Non-accredited colleges and universities are excluded from HEGIS.
- There are no follow-up data to permit estimates of occupational supply from the different fields and levels of study.
- Although completion data are available by field of study, enrollment data are not.

OIS Application(s):

Supply: Provides data concerning college and university training.

Complementary: Provides information on existing education/training institutions

Technical References:

Projects, Products, And Services Of The National Center For Education Statistics, USGPO, 1976.

A Taxonomy Of Instructional Programs In Higher Education by R.A. Huff and M.O. Chandler, DHEW-OE and NCES.

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DATA SOURCE: Industry Wage Surveys

Description:

Industry wage surveys provide data for occupations selected to represent the full range of activities performed by workers. Consideration also is given, in their selection, to the prevalence in the industry, definiteness and clarity of duties, and importance as reference points in collective bargaining.

In addition to collecting straight-time first-shift rates (or hours and earnings for incentive workers) for individual workers in the selected occupations, surveys in most industries also establish the wage frequency distribution for broad employment groups, i.e., production and related workers or nonsupervisory workers. Weekly work schedules; shift operations and differentials; paid holiday and vacation practices; and health, insurance, and retirement benefits are included in the information collected, along with the provisions made for other items, applicable to certain industries. The studies also provide estimates of labor-management agreement coverage, proportions employed under incentive pay plans, and the extent to which establishments provide a single rate or range of rates for individual job categories.

Fifty manufacturing and 20 nonmanufacturing industries, accounting for about 22.5 million employees, are surveyed on a regularly recurring basis. A majority are studied on a 5-year cycle, but a number of comparatively low-wage industries are on a 3-year cycle. In addition, special wage surveys also are undertaken at the request of others.

Nearly all of the manufacturing, utilities, and mining industries are studied on a nationwide basis and estimates are provided also for regions and major areas of concentration. Surveys in trade, finance, and service industries usually are limited to a number of metropolitan areas. Nationwide surveys generally develop separate estimates by size of establishment, size of community, labor-management agreement coverage, and type of product or plant group.

Limitations:

- The number of industries covered by these surveys are limited.
- Data for certain industries will not be reliable for State and area wage estimates.
- The occupational detail for which wage data are available may be limited by survey constraints.

OIS Application(s):

Characteristics: Industry Wage Surveys provide data on wages paid in certain occupations in various industries.

Technical References:

BLS Handbook Of Methods, Chapter 18--Occupational Pay and Supplementary Benefits

DATA SOURCE: (1) Job Bank Openings Summary Data (JBOS)
(2) Job Bank Employment Service Reports
(3) Job-Flo--Job Bank Frequently Listed Openings; Job-Flow Occupation Summary

Description:

(1) JBOS--This is a monthly report which provides information on job opportunities listed during the preceeding month with the public employment service Job Bank system. The data appear on microfiche, and include State, job bank district, number of job openings available, number unfilled-end-of-month, number 30 days old or more, occupational category and six-digit occupational code, employer job title, and pay scale (range).

(2) Reports--A computer listing of all unfilled job openings, as of a given day, which are listed with the State Employment Security field offices where such a bank is installed. In some states the Job Bank covers the entire State; in other states, one or more cities or counties are covered. Some states do not have a Job Bank. Some State ES agencies with Job Banks publish monthly or quarterly reports that summarize the data.

(3) Job-Flo--This summary, available monthly as a publication, presents frequently listed full-time, permanent job openings that were available at public job services offices during the month. The summary shows data by DOT code and employer job title. The individual district Job Bank reports show industrial code of employer placing the order, number of openings in the occupation, wage range, and number of openings left unfilled at the end of the month. Also included are the number of years of education and months of experience required by the employer.

Limitations:

(1) JBOS

- Data reflects only those job openings reported to ES local officer.
- Information is historical and represents only a small part of the total job market activity in a limited number of occupations and areas.
- Data are available only on microfiche cards.
- Procedures for assigning a DOT code to a specific job opening vary among Employment Security local offices.
- Not all areas in states have job bank program. Distribution of job bank information with employer's name attached is sometimes prevented by state disclosure laws.

(2) Reports

- Data are available on computer tape only for most states.
- Data refer only to openings received by ES field offices.

(3) Job-Flo

- Coding is limited to six-digit DOT codes which may not always be correctly applied.

- Data are limited to those states or areas within states which have job banks.

- Industry code and title is sometimes shown as "Employment Agencies."

- Wages show minimum, average, and maximum for total occupational group; the salary range may be very broad and does not provide the specificity necessary for individuals.

OIS Application(s):

Demand: JBOS provides indicators of current/comparable job openings available in Job Bank areas in various parts of the nation.

Job Bank Reports show "hard-to-fill" jobs and wages offered, by occupation.

Job Flo provides some indication of job vacancy status in certain areas at a given point in time.

Characteristics: Indicates some wage scale information by occupation and may reflect supply-shortage status by occupation. Trends may be obtained by manual posting of data.

Technical References:

U.S. Department of Labor, ETA, U.S. Employment Service, Office of Technical Support, Washington, D.C.; State and Job Bank offices of State Employment Security Agencies

DATA SOURCE: Local Area Unemployment Statistics (LAUS)

Description:

Unemployment estimates for States and local areas are developed by State employment security agencies to measure local labor market imbalance and hence are a key indicator of local economic conditions. These estimates are used by State and local governments for planning and budgetary purposes and as an indication of the need for local employment and training services and programs.

Under the Federal-State cooperative program, the Department of Labor develops the concepts, definitions and technical procedures which are used by State agencies for the preparation of labor force and unemployment estimates. Federal agencies use local area unemployment estimates to determine the eligibility of an area for benefits in various Federal assistance programs, such as the Comprehensive Employment and Training Act (CETA), the Public Works and Economic Development Act (PWEDA), the Concentrated Employment Program (CEP), and others.

In the development of unemployment estimates, three broad categories of unemployed persons are identified: (1) those who were last employed in industries covered by State Unemployment Insurance (UI) laws; (2) those who were last employed in noncovered industries; and (3) those who were either entering the labor force for the first time, or were reentering the labor force after a period of separation.

In the current month, the estimate of unemployment is an aggregate of the estimates for each of the three categories. An estimate for the covered category was derived from a count of current (UI) claimants and estimates of claimants whose benefits have been exhausted, persons who were disqualified from receiving benefits, and persons who filed claims late, or not at all. The estimates of persons who have exhausted their benefits and those in a disqualified status are based on the number actually counted in the current period, plus an estimate of those expected still to be unemployed from previous periods.

For the noncovered category, an estimate of unemployment is developed for each industry or class of worker subgroup. These estimates are based primarily on the "State covered unemployment rate" (the ratio of covered unemployment to covered employment), and the estimate of employment for the subgroup. For some subgroups, special scaling factors, based on relationships derived from national industry data, are used to control the size of the final estimate.

The third category, new entrants and reentrants into the labor force, could not be estimated directly from the UI system statistics because unemployment for these persons was not immediately preceded by a period of employment. Instead, an equation was developed to estimate total entrants into the labor force on the basis of the historical relationship of entrants to the experienced unemployed and the experienced labor force.

Limitations:

- There is no occupational detail in the LAUS program.
- Data are used for funds eligibility and allocation purposes and have limited direct applicability for use in an OIS.

OIS Application(s):

Complementary: LAUS data provide indicators of labor force trends

Technical References:

BLS Handbook Of Methods, Chapter 8--Measurement of Unemployment in State and Local Areas

New Procedures For Estimating Unemployment In States And Local Areas, (Report 432), U.S. Department of Labor, Bureau of Labor Statistics

DATA SOURCE: Labor Market Information (LMI) Program

Description:

In guidelines issued to the States by the Employment and Training Administration (ETA), labor market information is defined as:

> "...that whole body of knowledge relating to labor force, employment, unemployment, wage, supply and demand, occupational, industrial and economic and demographic information for the analysis of manpower problems."

At the State level, the State Employment Security Agency (SESA) is responsible for the implementation of the LMI Program. This effort includes the preparation of basic LMI core products, which are prepared for States, SMSAs, and in some cases for CETA prime sponsor areas. The development of these core products is dependent upon data from many of the other data sources summarized in this appendix. For example, industry employment data is provided by the ES-202 report, occupational employment data is provided by the Census or OES survey, and unemployment data is provided by the Local Area Unemployment Statistics (LAUS) program or UI reports. The LMI core products contain much of the information that is essential to the OIS. For FY 1980, the SESAs will be preparing the following core products (subject to funding limitations):

- LMI Newsletters
- Annual Planning Information (API)
- Occupational LMI
- Planning Information for Vocational Education
- A Directory of Labor Market Information
- Affirmative Action Information
- LMI or Special Worker Groups
- LMI Research

In the following paragraphs, brief summaries of the FY 1980 requirements for each of these core products are presented.

(1) LMI Newsletters should be prepared on a monthly basis for each State and Standard Metropolitan Statistical Area (SMSA) and for as many additional labor market areas as time and resources permit. The Newsletters should be released by the end of the month following the reference month and should review significant changes since the previous month and a year ago in employment and unemployment conditions for the State or area. Newsletters should also be used to announce the availability of new LMI publications as well as discuss events that may impact on labor market conditions in the State or area. Because the Newsletters are sent to a wide range of readers, emphasis should be placed on improved graphics in order to enhance the appearance of the publication and to make it easier to comprehend the tabular data provided.

(2) The Annual Planning Information (API) should be prepared once a year for all States, SMSAs, and CETA prime sponsor jurisdictions. The API is intended for use primarily by SESA and CETA planners but should be disseminated to other LMI users as well (vocational education authorities, State Occupational Information Coordinating Committee, Career Information Service, major employers, union officials, etc.). The API should provide historical, current and outlook information on employment, unemployment

and occupational trends, as well as numbers and characteristics of the population and labor force, unemployed, economically disadvantaged, underutilized persons, and other special groups. The API should be released in time for SESA and CETA planners to meet their respective deadlines and no later than May 31.

(3) Occupational LMI should be prepared for a wide range of data users. Because it is unlikely that a single publication can meet all the needs for occupational data, SESAs should prepare separate occupational LMI publications which provide specific types of occupational LMI. The publications of occupational LMI can vary from State to State, depending on the availability of occupational data in each SESA. However, each SESA should provide the fullest amount of occupational LMI possible, consistent with data availability, to meet the needs of data users. Following are examples of some of the types of occupational LMI publications which SESAs can prepare:

1. Quarterly supply-demand analysis (short-term)
2. Wage data (either wage surveys or a wage bibliography)
3. OES survey data (in survey States only)
4. Occupational projections (long-term)
5. Job search information (hiring specifications, working conditions, unionization, hiring practices, licensure and other requirements, location, hours of working, commuting, etc.)

The various occupational LMI publications may be prepared by the SESAs throughout the year as data for the States and areas become available.

(4) Planning Information For Vocational Education should be prepared annually for each State and SMSA. The information should include an analysis and tabular data concerning employment requirements in those occupations for which vocational education training would be appropriate. The information should be made available to State and local vocational education authorities by the end of the second quarter of the fiscal year, i.e., March 31.

(5) A Directory Of Labor Market Information should be prepared which will serve primarily as a catalog from which users can access SESA LMI publications. The Directory should contain a complete listing of all SESA LMI releases and publications prepared on a regular basis plus a listing of periodic releases, one-time studies or analyses. Utility will be enhanced by incorporating listings of labor market areas and key persons to contact for information, including local labor market analysts. The Directory should be updated at least every two years and more frequently if changes warrant.

(6) Affirmative Action Information. SESAs should provide the LMI needed by Federal contractors and subcontractors for their affirmative action programs as specified by the Office of Federal Contract Compliance Programs (OFCCP). The present guidelines for preparing such LMI (RAL 816) are being revised. SESAs may continue to use the RAL 816 guidelines until the revised guidelines are available.

(7) LMI On Special Worker Groups. This represents a modification of the previous LMI core product requirements involving the preparation of special publications on women, youth and veterans. In order to provide the SESAs with more flexibility in providing the types of data which are most appropriate for their State and areas, the SESAs are now able to select, beginning in FY 1980, the special worker group for which information will be provided each year. SESAs need provide only one publication during a fiscal year, although more than one special worker group may be covered if desired. The LMI publications on special worker groups should be selected from the following:

- Youth publication
- Publication on women
- Veterans publication
- Publication on blacks and/or Hispanics

The LMI on special workers groups should cover the State at a minimum, plus as many SMSAs within the State as data will permit. The publications should provide characteristics data (age, race, sex, etc.) on the population of the special group as well as the number of employed and unemployed. Because only one of the special publications are required during the fiscal year, each publicaton would be updated once every four years in those SESAs electing to address all four special groups. Updates would occur more frequently in those States which cover fewer of the special groups.

(8) LMI Research. This is a new LMI core product and reflects the importance of maintaining an active LMI research capability in the SESAs. In order to permit the SESAs to undertake such research, the quarterly LMI Review is elminated as a required core product, beginning in FY 1980, although SESAs may continue to prepare such Reviews (or reduce their frequency) if they wish to do so. In place of preparing the quarterly LMI Reviews, the SESAs must carry out at least one research project each year. Examples of the types of research which SESAs might consider include:

- Worker commuting studies
- Detailed industry analyses
- Research on energy
- Utilization of ESP for LMI

The above items are only suggestions; SESAs may elect to conduct other types of LMI research which are more appropriate for the State or areas. One copy of the findings should be sent to the National office. Studies which are of wide interest will be distributed by the National office to all SESAs.

* * * *

Several pieces of Federal legislation require the application of labor market information. The most significant pieces of legislation include:

- The Wagner-Peyser Act (1933), which requires a system to collect and furnish information on opportunities for employment and for operating the system of public employment offices created by the Act

- The Public Works And Economic Development Act (1965) which uses labor market information to identify areas of substantial and persistent unemployment and for resource allocation.

- The Comprehensive Employment And Training Act (1973), which requires local data for program planning by CETA prime sponsors, as well as national and local data for use in resource allocation (this Act also contains a specific section on labor market information).

- The Public Works Employment Act (1976) for resource allocation based on local unemployment levels; and information for funding priorities and establishing the National Occupational Information Coordinating Committee.

In summary, the Labor Market Information (LMI) Program should provide much of the information essential for the OIS. This resource should be fully utilized in OIS development efforts.

Limitations:

- The preparation of the core products is dependent upon the existence and quality of Federal/State statistical or data collection programs. Shortcomings in such programs will result in incomplete core products.

- Funding levels may constrain the preparation of all suggested core products in a fiscal year.

- Core products vary in content and format from State-to-State, thus limiting the comparability of data.

OIS Applications:

All Components: The LMI core products provide in publication form much of the data that are essential for OIS users.

Technical References:

The Labor Market Information System Of The Employment And Training Administration, U.S. Department of Labor, Employment and Training Administration (Reprinted from ETA Interchange)

Employment and Training Administration guidelines to State Employment Security Agencies

DATA SOURCE: Noncollegiate Postsecondary School Survey

Description:

The postsecondary school survey is conducted biennially by the National Center for Education Statistics in even-numbered years. Survey forms are mailed to all known public and private (proprietary and nonprofit) schools that offer occupational programs at less than the baccalaureate level. (The survey excludes HEGIS schools.) Enrollment data, by sex and full-time/part-time status, are collected for each program offered and coded by USOE classification system. A directory of schools is published shortly after all the returns are processed. From this survey, each State is sent its list of postsecondary schools. More detailed data on enrollments are available through the computer tape within three months of the close of the survey.

During the course of the survey, a 25 percent nationally representative sample of the schools are sent a longer form to gather data for each program offering on charges, length of program, number of completers and number of leavers with a marketable skill. These data are weighted to represent national totals only. Results of these data are published in Enrollments and Programs and are also available on computer tape.

NCES encourages State OICCs to participate in these studies, especially in the sample. For example, a sample of schools could be selected within the State to supplement the schools selected in the national sample. This would enable States to learn more of the private school offerings and related information.

Limitations:

- Data are not collected annually.
- Completer/leaver data for each school are not available for 1978 and previous years. However, this question has been added to the survey form for 1980.
- Charges and duration of program are available only on national basis. Participating States, however, can sample their schools to gather these data.

OIS Application(s)

Supply: Provides information on enrollments in all proprietary and nonprofit schools as well as individual public schools.

Complementary: Provides listings of institution and program offerings

Technical References:

Directory Of Postsecondary Schools With Occupational Programs, 1978

Enrollments And Programs In Noncollegiate Postsecondary Schools, 1976

Computer tapes available from NCES EDSTAT.

DATA SOURCE: Noncollegiate Postsecondary Student Characteristics Survey

Description:

The postsecondary students survey is conducted biennially by the National Center for Education Statistics in odd-numbered years. Survey forms are mailed to a sample of 6,000 students selected from a sample of 600 schools, using the Postsecondary Directory as the universe. Information is collected from each student on demographic characteristics (age, sex, racial/ethnic group, military status), work history and plans, education history and plans, reasons for selecting program and school, labor force status, current job, parents' education and occupation. Results of the survey are available on computer tape within three months of the close of the survey. Programs are coded by USOE classification system.

Limitations

- The data are not collected annually
- The data, per se, cannot be used for analyzing supply in each State unless the State elects to supplement the sample to sample their own State.

Technical References

Computer tapes available from NCES EDSTAT

Detailed description of sample and conduct of survey available from AVSB, NCES

DATA SOURCE: Occupational Employment Statistics (OES) Program

Description:

(1) Background:

The Occupational Employment Statistics (OES) Program is a Federal-State cooperative program designed to produce State and area data on current and projected occupational and industrial employment for use in planning education and training activities. It provides a systematic, conceptually and methodologically consistent approach for the development of these data among the cooperating State employment security agencies and is an important element in the system of labor market information program of the Employment and Training Administration.

The OES program has three elements. Briefly, they are as follows:

(1) The Occupational Employment Statistics Survey--a mail survey designed to collect current data on wage and salary employment by occupation and industry from nonfarm establishments. The surveys are currently carried out in 45 states over a 3-year cycle.

(2) The National/State Industry-Occupation Matrix System--a set of tables (one for each State and the District of Columbia) that, for a specific period of time, shows total employment in specific occupational categories, cross-classified by industrial sectors and class of worker categories, which are used as a principle tool in preparing estimates of current employment and projections of occupational requirements for States and sub-State areas.

(3) The State and area Occupational Projections Program--a program for developing and preparing estimates and projections of occupational requirements for States and areas.

(2) Program Elements:

(1) Occupational Employment Statistics Survey

The OES Survey is designed specifically to collect statistics on employment by detailed occupation and industry, and to obtain occupational estimates for the Nation and for the cooperating State agencies. It is a periodic mail survey conducted by State employment security agencies of a sample of nonfarm establishments to obtain wage and salary employment by occupation. The survey is conducted over a 3-year cycle (manufacturing industries one year; nonmanufacturing, except trade, the second year; and trade industries the third year). These data are used to estimate total employment by occupation and by industry for each State and for areas within each State. Employment information is currently being collected for between 2,000 and 2,500 occupations.

A specially prepared list of occupations has been designed for each industry or for each group of industries that generally has the same kinds of occupations.

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The OES sample is designed to yield reliable industry occupational estimates for the participating States and areas within those States. The sample members are selected primarily from the lists of establishments reporting to the State unemployment insurance program.

The sample design initially stratifies the universe of establishments by industry. All establishments employing 250 employees or more are included in the sample. In some industries and States the level of employment for establishments included with certainty is less than the 100 employees or more level. For establishments not included in the sample with certainty, an optimum allocation design is obtained by stratifying the industry by size classes and sampling the size classes with probability proportionate to the amount of employment contained in those size classes. Within each industry size stratum, the sample members are randomly selected.

The occupational distribution of the reporting respondents in each industry by size class is determined by deriving the ratio of the sum of the employment in each occupation to the sum of the total employment of the corresponding reporting establishments. These distributions then are multiplied by the corresponding benchmark estimates of total employment in that size class. Estimates for occupations in each industry group are derived by summing all the occupational size class estimates within that industry group. Similarly, the estimates of combined industry groups are derived by summing the individual industry components.

(2) The National/State Industry--Industrial/Occupation (I/O) Matrix System

The purpose of this program, which is being developed in cooperation with the Employment and Training Administration and State employment security agencies, is to assist in the development of estimates of current occupational employment, and projections of occupational requirements at the State and local levels.

The National/State Matrix System was developed in response to the employment and educational legislation of the past decade, which has continuously emphasized the need for more and better information concerning current and future local labor market conditions. Recent moves to decentralize the responsibility for employment planning and training activities to State and local jurisdictions should add even further to the demands for the information produced through this system.

The National/State Industry-Occupation Matrix System is basically an extension of the national matrix program. The system is designed to provide a set of 51 (all States and the District of Columbia) individual matrices, or tables, that present total occupational employment, cross-classified by industrial sectors, for a specific period of time. The system further provides for the development of matrices for the sub-State areas, usually Standard Statistical Metropolitan Areas. It also includes death and retirement rates by occupation for each State, which are used to estimate total occupational openings. A flexible, multi-purpose computer system will permit cooperating State employment security agencies to update their matrices as required, prepare sub-State matrices, incorporate data from the Occupational Employment Statistics (OES) Survey into the matrix system, and develop projections of occupational requirements by industry sector. By integrating the occupational employment estimates derived from the OES Survey into the matrix system, the States have the most detailed occupational employment data base ever available to all States. Currently, 27 states have an Industry/Occupation Matrix based on OES survey data.

The matrix is a tabular listing of data in industry-employment columns and occupational-employment rows, forming a grid which can be used either horizontally or vertically.

(3) State and Area Occupational Projections

The OES program is aimed toward the development of reliable estimates of current and projected occupational requirements data at the State and area levels, and ultimately, for the Nation. Although the OES survey is not performed in all States, projections are developed for all States. Systematic, standardized procedures for the State agencies to use in the development of occupational employment information for the States and areas within the States are being developed.

This Federal/State cooperative program places the responsibility for preparation of State and area occupational projections in the State employment security agencies. These agencies are the source of essential State employment statistics and have knowledge of current and prospective State and area economic conditions that are needed to make reliable industry and occupational projections. Each of the principal organzations have certain responsibilities. To further the objectives of the program, research is done by the State agencies that is incorporated into the system, as is their insight concerning the needs of data users.

The State and area projections produced through this program provide a measurement of the magnitude of change in occupational employment requirements over the projection period. They are not intended to be precise measurements of future occupational employment levels. No attempt is made to adjust the projections for cyclical movements in the economy.

The projections are updated frequently to reflect the latest available data and the knowledge of economic conditions, including plant closings and openings; technological innovations; and other factors necessary to produce the most reliable projections possible. To further this end, the State agencies responsible for the projections are encouraged to consult representatives of industry, labor, and other government agencies during the developmental process to incorporate the widest possible knowledge concerning the economic area for which the projections are being developed.

Limitations:

(1) OES Survey

- All surveys are subject to possible response and processing errors. These are reduced through reviewing, editing, and screening procedures and through contact with reporters.

- Estimates derived from sample surveys are subject to sampling error. In this program, sampling errors for occupational employment estimates are calculated and normally published with the estimates.

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- The survey's geographical detail is currently limited to selected SMSA's and statewide.
- All industries are not covered by the survey.
- Not all states participate in the OES survey.
- Self-employed, schools, health care services, local/state government, and agricultural workers are not covered by the OES survey although indirect estimates can be made utilizing census data.

(2) OES Matrix

- The current State matrices available to State agencies are based on data derived form several sources including the Census of Population, industry employment data obtained from regulatory and licensing agencies, and other sources of occupational information. Data from the various sources frequently differ in employment concept and definition; hence, the employment estimates are subject to the problems associated with analysis and adjustment. The data then indicate the relative importance of an occupation to other occupations within each industry goup. Consequently, the occupational estimates in the matrices should be used with caution, and should not be viewed as precise measurements. In addition, while the census-based matrices are restricted to about 1,700 occupations, the additional detail to be provided by the OES survey data should increase the utility of the system and reliability of the estimate. The surveys at this time do not cover schools, health care services, or local and State Government. The development of an Integrated IO Matrix (based on both Census and OES survey data) is a complex process that at present can only be performed by BLS in Washington.

OIS Applications:

Demand: Provides an estimate of current occupational employment.
Provides estimates of projected occupational demand.

Technical References:

Bureau Of Labor Statistics Handbook Of Methods For Surveys And Studies, Bulletin 1910; 1976, BLS

Occupational Employment Statistics Program Handbook, Draft, BLS Region IV, November, 1977.

Occupational Employment Statistics Program Survey Operations Manual (2nd Edition), USDOL-BLS and the Manpower Administration, Washington, D.C., 1974

DATA SOURCE: Occupational Guides and Brochures (Briefs and Monographs)

Description:

These guides are published by State Employment Security Agencies. Each guide comprehensively examines a specific job (e.g., automotive mechanic, airline pilot, legal secretary, keypunch operator, etc.). Although presentation format varies from State to State, similar essential information is covered. Areas covered include job duties, related tasks, working conditions, hours, benefits, entrance requirements, promotion systems, training programs, job search methods, and hiring outlook.

Limitations:

- Employment outlook is stated in general terms, not in numbers.
- Frequency of publication will affect the timeliness of the information.
- Some states do not include State and local information; this localization of information is critical if the guides are to be effectively utilized.

OIS Application(s):

Characteristics: Provide extensive information on the characteristics of selected occupations.

Technical References:

State Employment Security Agencies

DATA SOURCE: Occupational Outlook Handbook (OOH)

Description:

The OOH contains information on job duties, educational requirements, employment outlook and earnings, and working conditions for several hundred occupations and 35 industries. Information is based on data received from a variety of sources, including business firms, trade associations, labor unions, professional societies, educational institutions, and government agencies. The Handbook also contains a Dictionary Of Occupational Titles index, referenced to the third edition of the Dictionary and cross referenced to the fourth, the most recent edition. Another related BLS publication, the Occupational Outlook Quarterly, examines various occupational issues and program areas such as apprenticeship programs, counseling, etc. It is available through the Government Printing Office.

Limitations:

- The OOH provides national data. Each State and/or LMA may have different requirements in some occupations. Therefore, local data are required to supplement the OOH data.

OIS Application(s):

Characteristics:	Provides substantial data on the characteristics of specific occupations

Technical References:

The Occupational Outlook Handbook, U.S. Department of Labor, BLS, Bulletin, 1955, 1978

Occupational Outlook Quarterly, U.S. Department of Labor, BLS

DATA SOURCE: State Apprenticeship Agencies, Unions, And Professional Associations

Description:

A variety of brochures, reports, surveys, and studies are generally available from these organizations. Union reports on membership, wage and fringe benefits, and special requirements may be prepared and published by the State agency responsible for regulating or overseeing.

Limitations:

- Occupational titles are limited to those which are represented by the organization. In most cases, these titles can be converted to an appropriate classification.
- Each survey must be evaluated in terms of its methodology. In general, wage surveys by unions and professional associations tend to be relatively reliable and well-designed.
- Information from these organizations on career ladders may not be accurate for the occupation .

OIS Application(s):

Characteristics: A potential source of data on wages, career ladders, licensing or certification requirements and job duties

Technical References:

Contact appropriate organizations

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DATA SOURCE: State And National Apprenticeship System (SNAPS)

Description:

The State and National Apprenticeship System (SNAPS) is an information system designed to produce output reports displaying data on apprentice actions and characteristics by occupations, industries, and programs on a national, regional, and State basis. SNAPS also summarizes the numbers of registered programs, by type of program and by Bureau of Apprenticeship Training (BAT) or State Apprenticeship Agencies (SAA) assignment. Prior to the development of SNAPS, the need for accurate statistics on apprentices enrolled in all registered programs was unmet, as only data on those apprentices in federally-serviced programs were systematically collected and reported in standardized formats. State-serviced programs provided data from a variety of different reporting systems.

Criticism of apprenticeship programs for not enrolling minorities and women in sufficient numbers eventually led to the passage of 29 CFR, Part 30, which states that all apprenticeship programs registered with the Department of Labor or recognized State Apprenticeship Agencies must have "affirmative action programs."

These two factors, the need for "uniform" national apprenticeship statistics and for information on personal characteristics of apprentices, underscored the need for SNAPS.

SNAPS is designed to collect uniform information on apprenticeship programs within all States and U.S. Territories. The method for collecting the information varies depending on:

- Existing procedures for collecting, processing, and storing information on apprenticeship programs within each State
- Availability of field staff vis-a-vis staff in the central State office

Generally, however, a central record clerk, at the State level, maintains SNAPS data and submits the official SNAPS input to the ETA national office for further processing, and output report generation. The SNAPS User's Manual instructs record clerks to record both the industry and occupation in which an apprentice is registered. The industry is classified using the Standard Industrial Classification (SIC) Manual. The occupation is recorded using a DOT title and nine-digit code. As of July 1, 1978, the occupation is recorded using the Fourth Edition of the DOT. In the preparation of summary reports for submission to the Bureau of Apprenticeship and Training (BAT), SNAPS utilizes specially defined occupational groups that include specific DOT codes. There are some apparent inconsistencies in the composition of these occupational groups, making translations to the DOT non-routine. This internal coding system used in SNAPS inhibits the potential integration of SNAPS data into the supply component of an OIS.

SNAPS is a component of a large network of economic and employment and training program information systems. The information available through SNAPS on apprenticeship acitivity can be viewed as an integral part of the larger network of information systems which deal with employment, the economy, labor force supply and demand, and characteristics of the population which the various human resource development programs are not intended to serve.

Many statistics are recorded by the Department of Labor's Bureau of Labor Statistics (BLS) and the associated State Employment Security Agencies (SESA's) on employment and unemployment, occupational and industrial groups, and characteristics of the labor force. BLS data are, in part, based on the Census Bureau's Current Population Survey. SNAPS data complement the information network of labor force characteristics and actions in employment and training programs, by providing these essential data on all apprentices in registered apprenticeship programs. Data which describe trends in accessions and completions in apprenticeship training are recorded for analysis and comparison with other types of skill training.

Limitations:

- SNAPS and OES data overlap; whereas SNAPS collects data only on registered programs, OES does not determine the status of programs. This causes a problem in comparing data.
- SNAPS data are unavailable for local areas.
- DOT coding procedures vary among states.
- Only "registered" apprentices are counted. Many programs exist that are, in fact, unregistered apprenticeship programs. Registration is voluntary.

OIS Application(s):

Supply: Can be integrated as a source of supply data.

Complementary: Can be used to identify existing training programs and activities.

Technical References:

Apprentice Registration Actions, By Region And State, Employment and Training Administration (annual, USGPO)

SNAPS User's Manual--State And National Apprenticeship System, Employment and Training Administration, U.S. Department of Labor

DATA SOURCE: State Education Management Information System (MIS)

Description:

Many states have a State Education Management Information System that is utilized to collect enrollment, completion, program leaver, and follow-up data for education programs. These systems may be comprehensive in that they cover elementary, secondary, postsecondary, and higher education programs. In some states there may be several such systems according to how the functions of the Department of Education are allocated. The State Education MIS will generally utilize the U.S. Office of Education Instructional Program Codes as presented in the Standard Terminology For Curriculum And Instruction In Local And State School Systems, State Educational Records and Report Services, Handbook VI, Department of Health, Education, and Welfare. One important byproduct of these systems is that they can provide data on enrollments in completeness from vocational programs.

Limitations:

- Definitions of enrollments, completions, leavers, and training related placements are often inconsistent among Local Education Agencies (LEAs) or States.
- Data collected are of varying degrees of accuracy.

OIS Application(s):

Supply: Major source of supply data for most states.

DATA SOURCE: Tables Of Working Life--Vital Statistics

Description:

Job opportunities will arise because of the need to replace workers currently in the labor force. Separation from the labor force may result from death, retirement, disability, or temporary withdrawal for personal reasons. However, these losses generally are referred to as deaths and retirements and the rate at which people leave the labor force is known as the "death and retirement rate."

One technique for estimating deaths and retirements is based on "tables of working life." These tables are statistical or actuarial devices for summarizing the mortality experience of the population at some particular period of time, i.e., the death rates, by age, over a 1-year period. A life table starts with a hypothetical group of persons--usually 100,000 born alive--and follows the death rates of the real population at each age. Tables of working life also indicate labor force participation of the initial group of 100,000 from 16 years of age; it shows attrition caused by withdrawals from the labor force as well as by mortality. Tables of working life, which have been set up on an actuarial basis for both men and women, account for deaths and retirements (separately) at each age level.

Limitations:

- Attrition rates are based only on age-sex distributions and ignore many key variables such as education level of workers, pension benefits, occupational hazards and diseases, working conditions, etc.
- Rates based on Census occupational categories cannot be easily translated to different occupational classification structures.
- Age-sex distributions are generally not available for sub-State areas.
- It is difficult to contract an occupation specific table of working life.

OIS Application(s):

Demand: Used to estimate replacement demand.

Technical References:

Tomorrow's Manpower Needs, Supplement No. 4, Estimating Occupational Separations from the Labor Force for States, U.S. Department of Labor, BLS

Monthly Labor Review, "A Table of Expected Working Life for Men, 1968" June 1971

DATA SOURCE: Unemployment Insurance Data

(1) Employment, Wages, and Contributions, ES-202-Contributions Tax System

(2) Characteristics of the Insured Unemployment, ES-203--Benefits

(3) Unemployment Insurance Reports, ES-210--Benefits

Description:

(1) ES-202--The ES-202 is a quarterly report of employment and wage data obtained from private employers and government entities reporting unemployment insurance and, where applicable, disability insurance taxes. This is the most complete and detailed record available of employment by industrial activity and wages paid to workers. In some states it covers all gainful employment except domestics and self-employed persons. Usually, the data are made available in printed form for the State, county, and Standard Metropolitan Statistical Area. Data elements include industry code, industry title, number of firms (reporting units), total quarterly wages, and number of employees as of the mid-week of each month.

(2) ES-203--Provides demographic characteristics of persons in active unemployment insurance claims status, including age, sex, race, type of claim, number of weeks claimed, duration of unemployment, occupational and industrial attachment. Data are collected and reported monthly on a sample of records of continued claims filed by persons seeking benefits through regular State unemployment insurance programs. In some states, the sample is expanded to provide data for larger SMSA's.

(3) ES-210--A summary report of local office claims reported weekly via telegrams. Data is a preliminary count of initial claims for that week. Also shown is the status of claims--initial, additional, weeks claimed, interstate, unpaid weeks, trade disputes, etc. by type of unemployment insurance program.

Limitations:

(1) ES-202

- Data are at least six months old when available.
- Self-employed, agriculture employment and domestic workers are not included.
- No occupational data are available.
- Data may not be available in "wage-request" states.

(2) ES-203

- Available in most states on tape only.
- Data are limited by sample size and field office response, and poor occupational coding.

(3) ES-210

- These are aggregations of claims transactions and do not refer to individuals except to show gross numbers of claimants.
- Since state laws concerning eligibility differ widely, data are not always directly comparable.

OIS Application(s):

(1)	ES-202--Demand:	Indicates employment base by type of activity, concentration and number of firms. Permits analysis of employment trends, including seasonal changes in relation to UI and UCFE programs and for workload forecasting.
	Demographics:	Provides industrial profile of a given area by industry and size of employment.
(2)	ES-203--Supply:	In some states data are available at SMSA or county level. Can analyze utilization of manpower resources.
	Characteristics:	Data show characteristics of the qualified unemployed who are in UI claims status; opportunity to analyze causes of unemployment.
(3)	ES-210--Supply:	May be used in time series for economic trend analysis.

Technical References:

ES-202--State Employment Security Agencies
ES-203--Reports, State Offices of Employment Security Agencies
ES-210--Reports, State Employment Security Offices
Summary Of Employment Security Statistical Reports, August 1977, DOL-ETA

DATA SOURCE: Vocational Education Data System (VEDS)

Description:

The VEDS method of reporting secondary, postsecondary, and adult vocational education statistics to the Federal government will be implemented starting with FY 79 (July 1, 1978 - June 30, 1979). The first enrollment and completion information is to be available and reported by November 15, 1979 on a statewide basis. The first completer/leaver and employer follow-up will be conducted on or about April 1, 1980 and the results should be available within two to three months. Following is a detailed description of each component.

(1) Enrollments--NCES Form 2404 Part A, Section I - VII indicates unduplicated enrollment and completion data that should be available by sub-State areas. Part A gives enrollments by six-digit USOE code for 11th and 12th grade, postsecondary (associate degree only), long-term adult (500 or more hours), and short-term adult (less than 500 hours) students who are in occupational preparation programs. A brief description of the data reported in each section follows.

- Part A, Section I (Total Enrollment): This is an unduplicated total enrollment count of all persons included in Section III (enrollment in occupational preparation programs, 11th grade level and above, except short-term adults).

- Part A, Section II (Racial/Ethnic Designation and Sex): Includes enrollments by racial/ethnic group and sex that are reported in Section I (total except short-term adult) and Section III.

- Part A, Section III (Program Level): This includes unduplicated occupational preparation enrollments by program level, grades 11 and 12, postsecondary (associate degree only and does not include those pursuing a certificate or license), and long-term adult (500 or more hours and includes those in apprenticeship programs).

- Part A, Section IV (Short-Term Adult): Includes unduplicated enrollments of short-term adults (less than 500 hours). No follow-up of these persons is required by the VEDS reporting systems.

- Part A, Section V (Special Needs): This section is optional until FY 80, but may be available in some states before that time. The data will give detailed information on Handicapped, Limited English Speaking Ability, and Disadvantaged of those persons counted in Section I.

- Part A, Section VI (Cooperative Vocational Education): Included in this section will be unduplicated enrollments of students reported in Section I "who, by written (and on file) cooperative arrangements between the school and employers, are employed and receive compensation, receive instruction, including required academic courses and related vocational instruction by alteration of study in school with a job in any occupational field." This information may be of little value to an occupational information system though impact is made on the labor market.

- Part A, Section VII (I. Program Completers): Includes student reported in Section I "who finished a planned sequence of courses, services, or activities designed to meet a vocational occupational objective and which purports to teach entry-level job skills."

- Part A, Section VII (2. Transfers): Transfers are persons who have left a vocational program and have gone into another program of instruction. These students will not be included in VEDS follow-up activities.

- Part A, Section VII (3. Program Leavers): This includes persons who have left a vocational program before formally completing the program because they have sufficient entry-level occupational preparation to work in the field for which trained, taken a job related to field of training or other reasons. This information should be available by Program Level for those who "completed more than 50 percent" and "completed 50 percent or less." "Racial/Ethnic Designation and Sex" as well as "Handicapped" information is optional until FY 80.

(2) Follow-up--NCES Form 2404-7 Parts A-D. Each state is required to conduct a follow-up study for a sample of the completers and leavers that were reported on NCES Form 2404 Part A, Section VII (1. and 3.) and does not include "Transfers." This information is restricted to high school, postsecondary and long-term adults (500 or more hours). Persons who have completed a vocational program prior to June 30 of one fiscal year are followed up in April of the following year. The first follow-up collected through VEDS will be conducted during April, 1980 and will consist of persons who completed/left during FY 79.

States will be allowed to use a minimum sample of 20 percent that will be student-based, i.e., the student will be contacted via mail and/or personal contact. A reasonable response rate will be expected by NCES. A second aberration to the sampling technique involves those students who completed at most 50 percent of a program. Ten percent of the sample discussed above will be allowed. Each state will be required to submit their plan for sampling to NCES prior to implementation.

- Part A (1) Completer/Leaver Follow-up Report-Employment Status (follow-up) By Instructional Program (Completers Only): The civilian and military status and level of training (high school, postsecondary and long-term adult) is required by USOE code under the following categories:

  - Employed in a Field Related to Training
  - Employed in a Field Not Related to Training. Not Pursuing Additional Education

  Civilian and Military Status is not required for the categories given below--only level of training.

  - Pursuing Additional Education (Employed in Field Not Related to Training, Not in Labor Force, or Unemployed)
  - Unemployed (Seeking Employment) and Not Pursuing Additional Education

- Not in Labor Force and Not Pursuing Additional Education

- Status Unknown

Those persons reported in the items marked with an * should be included in an aggregation of persons who are available for placement in supply/demand data. Only those persons reported in the item marked with a + who are "Employed in Field Not Related to Training" or "Unemployed" should be included in supply information and not those who are "Not in Labor Force."

. Part A (2) Completer/Leaver Follow-up Report-Employment Status (Follow-up) by Instructional Program (Leavers Who Completed Over Half of the Program). The information available from this report will be identical (hence, the above discussion applies) to Part A (1) except for the status of persons upon leaving their training program (Leavers Who Completed Over Half of the Program).

. Part A (3) Completer/Leaver Follow-up Report-Employment Status (Follow-up)--(Leavers Who Completed At Most Half of the Program). The information required for this report is identical to Part A (1) except for the population involved and only totals are required. Even though the data will not be reported by USOE Code, most states should have the basic data by program code and it should be included in supply.

. Part B Employment Status (Follow-up) by Racial/Ethnic/Sex Designation. This information will be of limited value in developing an Occupational Information System.

. Part C Employment Status (Follow-up) of Handicapped Completer/Leavers. This data is not required by USOE code, but may be available by program code. This information may well be of value in the development of career information for the handicapped.

. Part D Completer/Leaver Follow-Up Report-Field of Employment and Average Hourly Salary by Instructional Program. This report includes only those persons who "were (1) employed (including military) in a field related to their training, or (2) employed (including military) in a field not related to their training and not pursuing additional training." Each returned form will be assigned a two-digit Standard Occupational Classification (SOC) code, based on the individual's employer, job title, and job duties. This information is not mandatory until 1981 (Follow-up of FY 80 completers/leavers).

This form requires a breakout by USOE code of the number of persons employed in each of 25 two-digit SOC categories and the average hourly salary of males and females. Basic data should be available for acquiring average hourly salary information by two-digit SOC code which might be supplementary to wage and salary data not available from the Employment Security Agency.

All enrollment and follow-up data is to be reported to VEDS by 114 six-digit USOE program categories with certain follow-up data reported by two-digit SOC code. A project has been funded by NCES/NOICC to develop a new set of program codes. These codes will consist of eight digits with the middle four digits being a primary SOC code (other SOC codes may also be matched with a particular program). There will be over 300 of these new codes.

Limitations:

- Sufficient funding may not be available to obtain the data in the desired level of detail.
- Data collection may overlap with HEGIS especially at the junior and community college level (for sub-baccalaureate degrees).
- Apprenticeships cannot be identified separately from long-term adults.
- Short-term adults (less than 500 hours) are not identified by detailed program.
- VEDS only covers programs included in the Vocational Education State Plan.
- Program categories are limited in detail.
- Follow-up data may be based on a limited sample size.
- Follow-up data will be classified using only two-digit SOC codes.
- No follow-up data will be collected on short-term adults or leavers completing less than 50 percent of a program.

OIS Application(s):

Supply: When operational, VEDS will be the major source of data on occupational supply from training/educational institutions.

Technical References:

Vocational Education Data System, NCES

DATA SOURCE: Vocational Rehabilitation Management Information System (MIS)

Description:

Many states operate a Vocational Rehabilitation Management Information System (MIS) to satisfy the statistical reporting requirements of the Rehabilitation Services Administration (RSA). RSA has established statistical reporting standards in the Rehabilitation Services Manual published in 1974. The basis of the standardized system of statistical reporting is form SRS-RSA-300, the Case Service Report. The form allows for individual client based reporting through the complete rehabilitation process, from first referral to final closure. The Case Service Report provides for reporting on the individual when first referred, when the referral process is completed, and when the case is closed from extended evaluation or from the active caseload.

Occupations of vocational rehabilitation clients are recorded at the time of case closure. The title of the occupation and the four-digit RSA occupation code are recorded. The RSA occupational coding structure is based on the Dictionary Of Occupational Titles, Third Edition, published in 1965. In most instances, the first four digits of the six-digit DOT codes are used for occupational coding purposes. For five specific employment situations, special codes have been devised. These codes, summarized in the table below, do not duplicate any four-digit codes in the DOT code structure.

Code	Employment Situation
5999	Homemaker (own home)
6999	Occupations indigenous to sheltered workshops, not elsewhere classified
7999	Unpaid family worker (own family), not elsewhere classified
8999	Vending stand clerk
9999	Vending stand operator

In some states, a vocational or occupational objective is established prior to a client receiving rehabilitation services. This pre-service vocational objective is also classified using a four-digit DOT code. The pre-service occupational code could be compared to the closure occupational code to determine if the initial objective was achieved.

The Federal reporting requirements established by RSA request that States provide summary statistical reports describing the occupational placements of clients. This summary report is a compilation of the four-digit DOT Codes reported. This report can help in ascertaining the supply of workers from vocational rehabilitation programs to the labor market.

Limitations:

- Occupational coding procedures are inconsistent since vocational rehabilitation counselors may be using an abridged list of DOT titles and codes rather than the DOT itself.

- Four-digit DOTs may not provide sufficient detail for certain applications of the data.

- Five employment situation codes are used in the RSA reporting standards that are not compatible with the DOT or other occupational classification structures.

OIS Application(s):

Supply: The Vocational Rehabilitation MIS in a state can indicate the number of clients that have completed a rehabilitation program and are available to work in a specific occupation.

Technical References:

Rehabilitation Services Manual, Department of Health, Education, and Welfare, Social and Rehabilitation Service, National Center for Social Statistics, July 1974

DATA SOURCE: Wage Surveys--Cities, States, Employer Councils

Description:

Surveys of compensation paid to workers, including commissions, bonuses, cash value of meals, lodging, and other gratuities, if furnished in connection with the job. Wages are usually paid by the hour for work rendered. Salaried positions usually assume a minimum number of hours for which payment is made.

Limitations:

- The classification structures vary; however, as the SOICC coordinates data programs it can encourage built-in uniform classification, or at least crossovers to standard classifications.
- These surveys range from excellent to very poor in design and execution. However, they have the distinct advantage of using local data and being up-to-date.
- Surveys are often biased by the groups surveyed (e.g., survey is limited to members of one group). Deliberate bias (to show low rates) occur for negotiation purposes.

OIS Application(s):

Characteristics: Potential source of wage data

Technical References:

Employment Cost Index, U.S. Department of Labor, BLS
Contact appropriate organizations

REFERENCE TABLE FOR APPENDIX B

OCCUPATIONAL, INDUSTRIAL, AND INSTRUCTIONAL CLASSIFICATION STRUCTURES

Classification Structure	Page
Census Occupational Classification System	B-1
Dictionary Of Occupational Titles (DOT)	B-2, 3
Higher Education General Information Survey (HEGIS)	B-4, 5
Occupational Employment Statistics Survey (OES)	B-6, 7
Standard Industrial Classification (SIC)	B-8, 9, 10
Standard Occupational Classification (SOC)	B-11, 12, 13, 14
USOE Instructional Program Codes (Handbook VI)	B-15, 16

CLASSIFICATION STRUCTURE: Census Occupational Classification System

Description:

The 441 occupational categories used in the 1970 census are assigned a three-digit code called a census code. These categories are further arranged into 12 major groups and identified as follows:

Census Code (range)	Major Occupation Group
001 to 195	Professional, technical, and kindred workers
201 to 245	Managers and administrators, except farm
260 to 285	Salesworkers
301 to 395	Clerical and kindred workers
401 to 580	Craft and kindred workers
601 to 695	Operatives, except transport
701 to 715	Transport equipment operatives
740 to 785	Laborers, except farm
801 to 802	Farmers and farm managers
821 to 824	Farm laborers and farm labor supervisors
901 to 965	Service workers, except private household
980 to 984	Private household workers

Limitations:

- Definitions are not provided for the occupational titles.
- Occupational groupings include a wide range of skill levels.
- There may be too few occupational classifications for certain applications.
- The Census occupational titles cannot be easily related to other occupational classification structures.

Technical References:

Alphabetical Index Of Occupations And Industries, Bureau of the Census, 1971

U.S. Census Of Population, 1970: Classified Index Of Industries And Occupations, Bureau of the Census

BLS Technical Memos

CLASSIFICATION STRUCTURE: Dictionary Of Occupational Titles (DOT)

Description:

(1) Background:

The first edition of the Dictionary Of Occupational Titles was published in 1939. It was developed due to the need of the public employment service system for standardized occupational information for job placement, employment counseling and occupational and career guidance, and labor market information services. The fourth edition contains almost 20,000 occuptions. Jobs are organized into "occupations" according to their similarities, and the structures and content of the occupation are defined. These definitions are based on studies of how similar jobs are performed across the country. Each occupation is incorporated into a classification structure in which jobs are given nine-digit code numbers (e.g., 201.368-010) which reflect the kind and level of work performed.

(2) Classification Structure:

The jobs are grouped according to some combination of work field, purpose, material, product, service, subject matter, generic terms, and/or industry, as reflected in the first three (3) digits of the code number. This arrangement groups jobs into nine broad categories:

0/1	Professional, technical and managerial occupations
2	Clerical and sales occupations
3	Service occupations
4	Agricultural, fishery, forestry and related occupations
5	Processing occupations
6	Machines trades occupations
7	Bench work occupations
8	Structural work occupations
9	Miscellaneous occupations

The categories are divided into 82 two-digit divisions, and the divisions, in turn, are divided into 559 separate three-digit groups, which reflect the first, second, and third digits of the code number, respectively.

The fourth, fifth, and sixth digits of the code number are based on the findings of the U.S. Training and Employment Service research concerning work function relationships data, people, and things. These relationships are expressed in a hierarchy, from the simple to the complex.[1] Each successive level in the hierarchy includes the simpler functions and excludes the more complex ones.

The final three digits of the code provide a unique identifier for occupation titles. These code numbers indicate the alphabetical order of titles within the six-digit code groups.

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[1] Each of the relationships to people represents a wide range of complexity, resulting in considerable overlap among occupations; their arrangement is somewhat arbitrary and can be considered a hierarchy only in the most general sense.

Three other codes which are associated with the DOT system are the Industrial Designation (indicates the type of economic activity with which the job is usually associated and the industry in which it is most commonly found), the General Education Development (GED) (indicates the amount of general education or life experience necessary for satisfactory performance of any given job), and the Specific Vocational Preparation (SVP) (indicates time required to achieve average performance level in a specific job).

Limitations:

- The need exists for comparison of DOT data to that of other information systems.
- The Dictionary does not contain all of the jobs in the U.S. economy, and a limited number of new jobs are created by technological change.
- Since the definitions are composites of jobs, the Dictionary may not be a good source for local job information.
- The DOT, because of the mammoth job required to update the volume, does not appear often enough to preclude certain occupations from becoming out-of-date with regard to job duties. However, where there is an indication that data on an occupation is no longer current, the Department of Labor maintains 11 Occupational Analysis Field Centers which can be consulted regarding changes to existing occupations and new and emerging occupations. (Locations for these field centers can be found on the inside of the back page of the DOT, 4th Edition.)
- A difficulty also exists in assigning proper occupational codes and titles to entry workers, due to their lack of general and/or specific education and/or training. Usually it is not possible to assign the full nine-digit code to entry workers, but the attempt is made to assign a six-digit code and a generalized title. Also, in job placement, to indicate that an individual is an entry worker, an (X) can replace the period after the third digit in the occupational code.

OIS Application(s):

The Dictionary Of Occupational Titles can be useful in numerous areas ranging from job placement to occupational research, career guidance, labor market information, curricula development and long-range job planning.

Technical References:

Dictionary Of Occupational Titles, 4th Edition, U.S. Department of Labor, USGPO

CLASSIFICATION STRUCTURE: Higher Education General Information Survey (HEGIS)

Description:

(1) Background:

HEGIS was first assembled from various periodic survey forms of the Office of Education in 1966. HEGIS represents an effort to prescribe not how instructional programs should be organized but how the majority of institutions of higher education actually do organize and record data on instructional programs. At the same time, it attempts to reflect categories for which data are needed. HEGIS was designed to be sufficiently flexible and comprehensive to facilitate adoption to overall institutional recordkeeping, apart from HEGIS reporting. The HEGIS data is compiled from surveys which include those of earned degrees and other formal awards, enrollment for advanced degrees, upper division enrollment by major, field of training for faculty, expenditures for instructional program, allocation of physical plant space by instructional program, etc.

(2) Structure:

HEGIS is divided into two sections. Section I deals with conventional academic subdivision of knowledge and training, and Section II contains technological and occupational specialties related to curricula leading to associate degrees and other awards below the baccalaureate. These two sections are divided into discipline divisions, which are further divided into discipline specialties. The first discipline specialty under the discipline division id titled "general" in order to provide some flexibility in the reporting scheme.

The classification code has four digits. The first two digits of the code identify the discipline division. Numbers 50 and above identify the technologies and occupational specialties of Section II. The last two digits are used to identify the discipline specialties.

There are six principal curriculum categories included in Section II. These categories, as explained above, are technological and occupational curricula leading to associate degrees and other awards below the baccalaurate. The six categories are:

5000 Business and Commerce Technologies
5100 Data Processing Technologies
5200 Health Services and Paramedical Technologies
5300 Mechanical and Engineering Technologies
5400 Natural Science Technologies
5500 Public Service Related Technologies

Limitation:

- The HEGIS discipline specialty list was not designed to have the specificity of a list of individualized courses.
- There is a lack of consistent terminology among the participating agencies and institutions.
- The necessity exists for the use of several codes to properly identify a particular faculty member, student, or facility.

OIS Application(s):

Supply: Provides information as to the instructional programs and curricula now in existence or likely to appear in the future.

Provides information for institutional recordkeeping and for structuring program budgets through its classification system as to the distribution of students, faculty assignments, finance and space.

The HEGIS taxonomy has been adopted as the core portion of the Program Classification Structure developed by the Western Interstate Commission for Higher Education's Management Information Systems Program (WICHE-MIS), and will be essential for use of the WICHE-MIS standard models and cost exchange procedures.

Technical References:

Products,Projects, And Services Of The National Center For Education Statistics 1976, USGPO

A Taxonomy Of Instructional Programs In Higher Education by R.A. Huff and M.O. Chandler, U.S. DHEW-OE and NCES

CLASSIFICATION STRUCTURE: Occupational Employment Statistics (OES) Survey

Description:

The OES survey occupational classification system is a combination of two widely used systems. Titles and descriptions of occupations used for data collection are derived primarily from the Dictionary Of Occupational Titles, Third Edition. The Census of Population is the other major source used for occupational classification. The census is made up of about 400 categories reflecting broad occupational coverage without definitions. The Dictionary Of Occupational Titles, on the other hand, is a more detailed classification system with definitions of each occupation and is organized to meet the operating needs of the public employment service. These two systems, plus information compiled from industry officials and other sources, contributed to the OES occupational classification system. This system is organized to allow for the constant state of change that occupational terminology and classification undergo.

(1) Survey Code--Each occupation included in the OES survey program has been coded in accordance with a standard five-digit coding structure developed by BLS especially for the OES survey collection process. The structure has been designed to allow sufficient flexibility for the addition of many more occupations than currently exist and for the addition of applicable occupations from other segments of the national economy which have not yet been included in the OES program. The structure further indicates major occupational sub-divisions which are common to all segments of the economy. It is designed to unite into a homogeneous coding structure all occupations included in a variety of major categories to allow for almost automatic summarization within each category. This feature is critical to the minimization of computer costs. The major occupational code series covering the five-digits of this coding structure and the major occupational classes are shown below. Four of the five digits are always numerical; the third digit is frequently a letter.

Major Five-Digit Occupational Code Series	Major Class Of Occupation
10000	Managers
20000	Professionals
30000	Technicians
40000	Service Workers
50000	Maintenance, Production, Etc. Workers
60000	Clerical Workers
70000	Sales Workers

Because of the large number of occupations in series 50000, combined numeric/alpha codes are used for some occupations within the series. The use of numeric/alpha codes is necessary so as not to exceed five digits in this major code series.

(2) Matrix Code--The OES Matrix Code has an eight-digit structure. Five digits correspond one-for-one to the survey code. The remaining digits provide for a lot of subtotals, summaries and aggregation. These subtotals correspond to the 1970 Census occupational groups.

Limitations:

- OES does not contain the occupational detail of the DOT
- No agricultural occupations are included in the OES

Technical References:

OES Survey Operations Manual, Second Edition, U.S. Department of Labor, Bureau of Labor Statistics and the Manpower Administration, December 1974

OES Dictionary Of Occupations, BLS

CLASSIFICATION STRUCTURE: Standard Industrial Classification (SIC)

Description:

(1) Background:

The Standard Industrial Classification was developed for use in the classification of establishments by type of activity in which they are engaged, for purposes of facilitating and promoting uniformity and comparability in the presentation of statistical data collected by various agencies of the United States Government, State agencies, trade associations, and private research organizations. The Standard Industrial Classification for establishments differs from a classification for enterprises or companies. A Standard Enterprise Classification related to the Standard Industrial Classification has been developed for use in classifying enterprises. Other classifications have been developed for use in the classification of commodities or products and also for occupations.

The Standard Industrial Classification is intended to cover the entire field of economic activities: agriculture, forestry, fishing, hunting, and trapping; mining; construction; manufacturing; transportation, communication, electric, gas, and sanitary services; wholesale and retail trade; finance, insurance, and real estate; personal, business, repair, and other services; and public administration.

In preparing the Classification, the Technical Committee on Industrial Classification was guided by the following general principles:

(1) The Classification should conform to the existing structure of American industry.

(2) Each establishment is to be classified according to its primary activity.

(3) To be recognized as an industry, the group of establishments constituting the proposed classification must be statistically significant in the number of persons employed, the volume of business done, and other measures of economic activity.

For purposes of this classification, an establishment is an economic unit, generally at a single physical location where business is conducted or where services or industrial operations are performed.

(2) Classification Structure:

The structure of the classification makes it possible to tabulate, analyze, and publish establishment data on a division, a two-digit, a three-digit, or a four-digit industry code basis, according to the level of industrial detail considered most appropriate. An agency may use additional subdivisions within specific four-digit industries in adopting this classification for its own use, while still retaining comparability with the classifications used by other agencies.

It should be noted that the digit "9" that usually appears in the third or fourth-digit position of the classification code designates miscellaneous three-digit groups or four-digit industries covering establishments "not elsewhere classified". These residual establishments do not usually constitute homogeneous primary activity groups; for purposes of this classification system they are grouped together and treated as a separate industry to retain the homogenity of the other industries in the group.

All establishments primarily engaged in the same kind of economic activity are classified in the same four-digit industry, regardless of their types of ownership; hence, their owners may include such diverse legal organizations as corporations, partnerships, individual proprietors, government agencies, joint ventures, etc.

Each establishment is assigned an industry code on the basis of its primary activity, which is determined by its principal product or group of products produced or distributed, or services rendered. Ideally, the principal product or service should be determined by its relative share of "value added" at the establishment. In practice, however, it is rarely possible to obtain this measure for individual products or services; typically, it is necessary to adopt some other criterion which may be expected to give approximately the same results in determining the primary activity of an establishment. It is recommended, therefore, that, when available, the following data measure be used for each of the major economic sectors in assigning industry codes:

Division	Data Measure
Agriculture, forestry, and fishing, hunting, and trapping (except agricultural services)	Value of production
Mining	Value of production
Construction	Value of production
Manufacturing	Value of production
Transportation, communication, electric, gas, and sanitary services	Value of receipts or revenues
Wholesale trade	Value of sales
Retail trade	Value of sales
Finance, insurance, and real estate	Value of receipts
Services (including agricultural services)	Value of receipts of revenue
Public administration	Employment or payroll

Even though a data collecting organization may have no immediate need to analyze or publish establishment data at the four-digit industry level of classification, it may nevertheless be useful to assign four-digit codes to each establishment report wherever the information is available and the incremental cost of such classification is not excessive. The four-digit code assignment should be made directly on the basis of the primary products, services, or activities reported by each establishment at the four-digit industry level of detail. It is possible for the classification of an establishment, based on its primary activity at the two- or three-digit level, to differ from that assigned on the basis of its primary activity at the four-digit level.

Limitations:

- As stated above, the need is present to have both constancy--providing for comparability in most industries--and currency--recognizing important changes in industry.

- In some instances, in activity-diversified establishments, an industry classification based upon the recommended output measure will not represent adequately the realtive economic importance of each of the varied activities carried on at such establishments. In such cases, employment or payroll information should be used to determine the primary activity of the establishments.

- The SIC is a classification of establishments, rather than legal entities or enterprises, by kinds of business, and not by occupations or commodities.

OIS Applications:

The SIC is widely used by individual business firms for classification of their customers and suppliers in market research, as well as by non-government research and business organizations, and trade and professional associations which compile statistics supplementing those provided by Federal agencies.

Industrially classified statistics are used not only to show how industries which compromise the economy have done over the past year, but to indicate the emerging and rapidly growing industries. For the first use, statistics need to be comparably classified over an extended period of time, and for the second use comprehensive and frequent changes should be made to keep abreast of the industrial composition and structure of the economy as it currently exists.

Technical References:

Standard Industrial Classification Manual, 1972, Executive Office of the President, OMB

CLASSIFICATION STRUCTURE: Standard Occupational Classification (SOC)

Description:

(1) Background:

The Standard Occupational Classification provides a mechanism for cross-referencing and aggregating occupation-related data collected by social and economic statistical reporting programs. The system is designed to maximize the analytical utility of statistics on labor force, employment, income, and other occupational data collected for a variety of purposes by various agencies of the United States Government, State agencies, professional associations, labor unions and private research organizations.

The Classification covers all occupations in which work is performed for pay or profit, including work performed in family-operated enterprises where direct remuneration may not be made to family members.

The SOC provides a coding system and nomenclature for identifying and classifying occupations within a framework suitable for use in and out of government.

In developing the Classification the following principles were followed:

(1) The classification should realistically reflect the current occupational structure of the United States.

(2) An occupation should be classified on the basis of work performed. Skill level, training, education, licensing and credential requirements usually associated with job performance should be considered only when an inaccurate picture of the occupational structure would be presented without such consideration.

(3) Place of work (industry) should be considered in classifying an occupation only when the work setting alters the nature of the work sufficiently to warrant separate classification. For example, cooks in private households and commercial settings were classified in different unit groups because work is significantly dissimilar in their respective work settings.

(4) The occupations should be classified in homogeneous groups that can be defined so that the content of each group is well delineated.

(5) An occupation that combines two distinct activities should be classified in one group on the basis of the primary activity--the one that accounts for the major portion of the worker's time. However, in cases where one activity requires special skills that are crucial in carrying out the duties of the occupation (although not required for as much time as other activities), that activity should determine the classification of the occupation.

(6) Each occupation should be assigned to only one group at the lowest level of the classification system (unit group).

(7) Large size should not by itself be considered sufficient reason for separate identification of a group.

(8) Small size should not be considered sufficient reason for excluding a group from separate identification, although size must be considered, or the system could become too large to be useful.

(9) Supervisors should be identified separately from the workers they supervise wherever possible in keeping with the real structure of the world of work.

(10) Apprentices and trainees should be classified with the occupations for which training is being taken.

(11) Helpers should be identified separately when their work is such that they are not in training for the occupation they are providing help, or if their work is truly different.

(12) The need for comparability to International Standard Classification Of Occupations should be considered in developing the structure, but it should not be an overriding factor.

(2) Classification Structure:

The SOC is structured on a four-level system: division, major group, minor group, and unit group. Each level represents groupings in successively finer detail which enables users to tabulate or analyze data on different levels of aggregation. Residual categories are established, where necessary, at all levels to handle groups of occupations that do not warrant separate identification or do not fit into one of the specific groups.

Each group includes a listing of Dictionary Of Occupational Titles, Fourth Edition (DOT) titles which are descriptive of the group. They are included in the classification. The titles shown in each group with a nine-digit code following them are from the DOT. Immediately following the title there may be a I, II, III, or IV; these numbers indicate that there is more than one occupation with the same title and industry designation. The first column of numbers, where there are two columns of numbers, is the code for the industry designation that the DOT uses to designate the "kind of industry or industries" where the job is found. It contains from one to four sets of three-digit numbers. The last column contains the nine-digit code corresponding to the title. These titles, codes, and industry codes are explained in one of the volumes of the Dictionary Of Occupational Titles, Fourth Edition.

Selected occupational titles from the 1970 Census of Population Classified Index Of Industries And Occupations are also included in the groups. The Census titles were added to provide additional insight to the content of these groups. These titles have a single three-digit number following them in a column near the center of the page. These codes are Census occupation codes and can be found in the above-mentioned publication.

Limitations:

- Because of the vast amount of occupational detail that was considered in developing such a system, and the wide variety of uses of occupational data, it was not possible to construct a system that will meet the specific needs of all organizations. The level of detail, for example, may not be sufficient for specialized analytical purposes or for internal organizational management requirements. In such cases, however, approaches can generally be taken that will not conflict with the general scheme of the system. It is recognized that the experience gained in using the system and the changes in the structure of occupations will necessitate periodic reviews.

- The SOC was not developed for any programmatic use. It does not define any particular category of occupations that may be affected by existing or future administrative programs. Administrators who may wish to use the classification in future programs that are not statistical must determine that the system is appropriate for their particular use.

OIS Application(s):

Federal government agencies will be encouraged to use the SOC for collecting occupational data, planning occupational education and training programs, planning occupational research and analysis, planning and placement services, studying the mobility of workers, and related activities dealing with occupational statistics. State and local governments, business and labor organizations and research groups are encouraged to use it for statistical programs. Where the SOC detail is not sufficient for a specific use, subclasses should be developed that are compatible. Where conceptual compatibility cannot be avoided without causing program difficulties, cross-references should be made to the extent feasible.

New or unique occupations that are not described or listed in the SOC should be classified in the group to which it is most similar.

The system allows tabulations to be made for special purposes of data from different unit groups. For example, college and university teachers are classified by subject matter taught, which allows teachers to be combined with subject matter specialists, i.e., college chemistry teachers and chemists.

Publication formats of occupational data should follow this structure for major tabular presentations, but recombinations such as mentioned above are encouraged for supplemental analysis.

For some presentations, especially of cross-tabulated data, a very abbreviated set of occupational classes may be needed. In order to provide for standardization of such abbreviated or aggregated groups, the following groupings are suggested:

(1) Administrative, engineering, scientific, teaching, and related occupations, including creative artists (Major Groups 10-34);

(2) Technical, clerical, sales, and related occupations (Major Groups 36-48);

(3) Service occupations, including military occupations (Major Groups 50-53 and 91);

(4) Farming, forestry, fishing, and hunting occupations (Major Groups 55-58);

(5) Production occupations, including construction, extractive, transport, and related occupations (Major Groups 60-83 and 99).

Technical References:

Classified Index Of Industries And Occupations

Dictionary Of Occupational Titles, Fourth Edition (DOT)

International Standard Classification Of Occupations

Standard Occupational Classification Manual, U.S. Department of Commerce, Office of Federal Statistical Policy and Standards, 1977

Standard Occupational Classification Manual--Index, Executive Office of the President, OMB Statistical Policy Division, 1977

CLASSIFICATION STRUCTURE: United States Office of Education Instructional Program Codes (USOE) (Handbook VI)[2]

Description:

(1) Background

The codes for the instructional programs in the Office of Education classification system were intended to help local and state education agencies identify, classify, and describe information about subject matter and curriculum activites. Twenty subject-matter areas, plus one area for co-curricular activities and one area for general elementary and secondary education were identified in Standard Terminology For Curriculum And Instruction In Local And State School Systems, State Educational Records and Report Series, Handbook VI, Department of Health, Education and Welfare.

Seven of these areas were designated for vocational-technical education. Within these areas, vocational-technical instructional programs are identified, coded, and defined as follows:

01.	Agriculture
04.	Distributive education
07.	Health occupations education
09.	Home economics
14.	Office occupations
16.	Technical education
17.	Trade and industrial occupations

The definitions of the vocational-technical education areas, and their subject matter was determined by: (1) an extensive study of record and report forms of local school systems and state education agencies. (2) an extensive review of the professional literature concerned with subject-matter areas and co-curricular activities, and (3) conferences with numerous persons in state education agencies, local school systems, colleges and universities, and the U.S. Office of Education.

(2) Classification Structure:

The USOE code is the identification code for instructional programs. Although Handbook VI contains ten-digit codes, the codes defined in the Vocational Education And Occupations have generally been limited to six digits. In a few cases, eight-digit codes were used to allow for greater detail in describing instructional programs. The interpretation of the codes is as follows:

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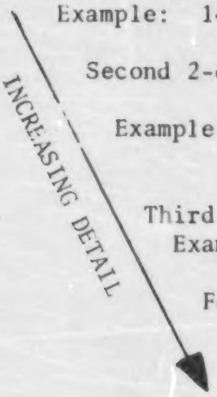
[2] This instructional discipline taxonomy is currently being revised under an NCES contract. The resulting taxonomy will encompass all education programs and will replace the current Handbook VI and HEGIS codes.

14.020201



First 2-digit position: subject matter area
Example: 14. OFFICE OCCUPATIONS

Second 2-digit position: principal segment of subject matter
Example: 14.02 BUSINESS DATA PROCESSING SYSTEMS OCCUPATIONS

Third 2-digit position: division of principal segment
Example: 14.0202 PERIPHERAL EQUIPMENT OPERATORS

Fourth 2-digit position: first-level detail of division of principal segment
Example: 14.020201 KEY PUNCH AND CODING EQUIPMENT OPERATORS

The USOE code is flexible, ranging from broad subject-matter areas to very specific programs. Each succeeding level of specificity is considered to be subsumed in the previous one. In assigning a code to a program, the most specific code that is applicable should be used.

The code numbers ending in "99", located at the end of each subject matter area, designate an instructional program being offered that is not identifiable by other subject matter codes. Note: the addition of the word "other" to the USOE code title.

Example: 14.0199 ACCOUNTING AND COMPUTING OCCUPATIONS, OTHER
Example: 14.0299 BUSINESS DATA PROCESSING SYSTEMS OCCUPATIONS, OTHER
Example: 14.0399 FILING, OFFICE MACHINES, AND GENERAL OFFICE CLERICAL OCCUPATIONS, OTHER

Limitations:

- The descriptions of the instructional programs are composites of subject matter, rather than well-defined courses.
- Special care in interpretation is necessary where four-digit USOE codes are used. The four-digit code may:

  (1) Indicate programs which are combinations of specialized programs, such as those under it in the classification system.

Example: 17.02 APPLIANCE REPAIR includes at least two principle segment divisions, i.e., 17.0201 ELECTRICAL APPLIANCES and 17.0202 GAS APPLIANCES.

2) Provide a means of summarizing data for an entire group. Data is aggregated up to the four-digit code.

Example: 14.02 BUSINESS DATA PROCESSING SYSTEMS OCCUPATIONS may be used to include 14.0201, 14.0202, 14.020201, 14.0203, and 14.0204.

Although the codes are structured by general subject matter areas, i.e., .09 HOME ECONOMICS, there are instances where there is a duplication of segment of subject at the four- and six-digit levels. For example, 09.0203 FOOD MANAGEMENT, PRODUCTION AND SERVICES and 17.2999 "QUANTITY FOOD OCCUPATIONS, OTHER" duplicate subject matter content of these programs. While this is not considered a problem by training program administrators, it is a problem for technicians utilizing data collected and tabulated with USOE codes for demand information.

OIS Application(s):

Supply: The USOE Code is used to categorize enrollments and completions in vocational education programs for reporting purposes.

Technical References

Standard Terminology For Curriculum And Instruction In Local And State School Systems, State Educational Records and Report Series, Handbook VI, Department of Health, Education, and Welfare

REFERENCE TABLE FOR APPENDIX C

CROSS CODE REFERENCES

Cross Code — Page

California Cross Code Index (Census-DOT-USOE)....................C-1, 2

Tomorrow's Manpower Needs--Supplement 3 (Census-USOE-DOT)........C-3, 4, 5

Vocational Education and Occupations (USOE-DOT)..................C-6

Vocational Preparation and Occupations (DOT-USOE-SOC-Census-OES).C-7, 8, 9

CROSS CODE: California Cross Code Index (Census-DOT-USOE)

Description:

The manpower and vocational education planner, as well as the occupational counselor, is faced with the problem of how to effectively use the information available from DOT, Census, and USOE coding systems. At the present time, in order to respond to accountability requirements, administrative requests and routine planning functions, the planners must collect, analyze and utilize data from a variety of sources. Because different agencies collect and compile information for different purposes, the data obtained from one agency is not always directly compatible with that of another agency. Employment program planners and vocational educators recognized the problem of a lack of interrelatedness and interdependence of the data in the three primary systems and agreed that there was a need for developing a new system to associate and cross reference the data.

The Cross Code Index was designed to link together three primary coding systems. It contains information pertaining to approximately 220 USOE codes, 14,200 base and defined related occupational titles from the DOT, and 441 census codes. The different numbers of codes in each of the three systems prevents simple one-to-one relationships in the Cross Code Index.

This can be clarified further by asking and answering the following questions:

- Does every DOT code have a census code? Yes
- Does every DOT code have a USOE code? No
- Does every USOE code have a DOT code? Yes, one or more
- Does every USOE code have a census code? No
- Does every census code have a USOE code? No
- Does every census code have a DOT code? Yes, one or more

The magnitude of information in the Cross Code Index required dividing the Index into four volumes. Volumes II, III, and IV contain virtually the same basic information but are presented in three different formats. Each format features one of the three codes and shows the relationships between the other two. Volume I of the Cross Code Index provides definitions, explanations and examples of uses of the tables contained in the other three volumes.

The Cross Code Index was originally designed to correlate and report occupational information and to act as the necessary link in facilitating occupational demand and supply comparisons. Occupational demand is currently reported by census groups while occupational supply data is reported by USOE codes which are further defined by DOT codes and titles. The Cross Code Index identifies and displays the relationships between these three codes.

It enables planners and counselors to make better use of the Manpower reports. For instance, vocational education planners may find the Cross Code Index helpful for translating the occupational demand information, provided in the Industry/Occupation Matrix, so that it can be compared to vocational education program enrollments of a given geographic area. This information can serve as one indicator for determining the necessity for initiating a new vocational education program. Occupational counselors can use the Cross Code Index to explain the relationship of academic education and vocational education to the actual skill requirements of specific occupations. The information in the Cross Code Index permits a very comprehensive look at work, at education as it relates to work, and at the numbers of people currently employed and projected to be employed in different types of work.

The Cross Code Index can provide its users with the most comprehensive source of occupational information currently available--when used in conjunction with the Vocational Education And Occupations, USOE # OE-80061, July, 1969, the Dictionary Of Occupational Titles (DOT), Volumes I and II, USDOL, 1965.

Limitations

It is important to note that this matching capability produces only a preliminary assessment and care should be taken to further verify the results obtained in this manner.

OIS Application(s):

Supply-Demand Interface: A mechanism for matching supply data to demand data

Technical Reference:

California Manpower Management Information System

Labor Market Information and CETA Planning, U.S. Department of Labor, ETA

Cross Code Index Explanation and Usage Manual, Volume 1, California Manpower Management Information System, (CMMIS) 1976

Cross Code Index--Training Package, CMMIS

Cross Code Index, Volume 2, 3 and 4, CMMIS

CROSS CODE: Tomorrow's Manpower Needs--Supplement 3 (Census-USOE-DOT)

Description:

(1) Background

One of the most complex problems facing educational planners is how to use available occupational supply and demand data for the purpose of setting prudent planning priorities. In addition to the myriad factors which make interpretation of the data difficult, such as the occupational and geographic mobility of workers, the educational planner is faced with occupational and educational classification systems which discourage a systematic matching of supply and demand data.

Unfortunately, the classification systems as they are presently constructed do not permit a clear-cut matching of categories on a one-to-one basis. Perhaps the fundamental barrier to a perfect matching of manpower projections and instructional programs is that the various classification systems were developed for different purposes. The vocational education instruction codes were created primarily to facilitate educational planning, to standardize terminology, and to simplify reporting of educational statistics. The instructional programs are composites of subject matter organized to assist the teaching of certain skills that often encompass a variety of jobs. On the other hand, the occupational classification schemes incorporated in manpower projections were designed primarily to enumerate jobs which require extensive formal or specialized training or in which large numbers of people are employed. In short, the problem is that the cluster of jobs in the instructional program frequently differs from the cluster of jobs under an occupational heading.

The conversion table is designed as only a temporary aid for those concerned with matching the various occupational classification systems. The final clarification of occupational classification systems awaits the completion of the Standard Occupational Classification System sponsored by the Office of Management and Budget.

(2) Source of Data

The source of data for the conversion table was a special tabulation from a sample household survey taken in April 1971 by the Bureau of the Census as part of its regular Current Population Survey (CPS). The roughly 60,000 individual responses were allocated to census occupational categories by the Census Bureau and were independently coded to the 1965 Dictionary Of Occupational Titles (usually at the nine-digit level) by the Occupational Analysis Field Centers, part of the U.S. Employment Service, under the direction of the Manpower Administration.

(3) Construction Of The Table

The conversion table was developed by first relating the Census-based BLS matrix occupational classification system to the Dictionary of Occupational Titles and then relating the DOT to the vocational education program codes and titles. The first step was facilitated by the census-to-DOT conversion produced from the CPS sample data. Since the BLS matrix occupational categories are virtually synonymous with the census categories, a link is thereby established between the Census-based BLS matrix and the DOT. The second step was made possible by the table in Vocational Education and Occupations that links the DOT to vocational education program codes and titles. Thus, the DOT serves as a bridge between the Census-based BLS matrix and the vocational education system.

Since a complete listing in the conversion table of all of the DOT codes and titles associated with each BLS matrix category would be unwieldy and would aggravate problems of interpretation, only those DOT occupational titles and codes that constitute at least 5 percent of the total estimated employment in the related matrix category are listed. After the DOT codes and titles which constituted at least 5 percent of estimated employment within each matrix category were determined, each specific DOT was related to its corresponding vocational education code and title (if any) by using the table in Vocational Education And Occupations.

Three rankings occur within each matrix title of the conversion table. These rankings serve to indicate the relative importance of the entries in relation to employment.

Ranking vocational programs. The first ranking is that of the vocational programs within each matrix title in those cases where more than one vocational program was associated with a particular matrix category.

Ranking codes within each vocational program. The second ranking is that of the DOT codes and titles within each vocational program.

Ranking DOT codes with no corresponding vocational programs. The final ranking is that of the DOT codes with no corresponding vocational education programs.

Limitations:

- This cross code was developed to be a temporary tool for matching classification systems to be used until full development and implementation of the SOC occurs.
- Planners should be cautioned also that some DOT codes and associated instructional programs may be overemphasized while other important codes and programs may not appear in the table. This problem arises because the 5 percent criterion has been applied to matrix occupatonal categories that differ in size. As a result, specific DOT job titles and associated instructional programs in the smaller matrix categories may be listed in the table even though their employment is relatively small nationally. Conversely, specific DOT codes and associated instructional programs that contain relatively large employment nationally may not be listed in the table because they appear in large matrix categories.

- Limitations of the table:

  - The source of the data is a small, limited sample that has errors of coding or judgment or both. Some important DOT titles and jobs and related vocational educational instructional programs may have been overlooked, while others may have been over emphasized.

  - The structure of the various occupational and educational classification systems does not allow a one-to-one matching of the several systems.

OIS Application(s):

Supply-Demand Interface: A mechanism for matching supply data to demand data

Technical References:

Matching Occupational Classifications To Vocational Education Program Codes, Tomorrow's Manpower Needs, Supplement 3 (Revised), U.S. Department of Labor, BLS, 1975

CROSS CODE: Vocational Education and Occupations (USOE - DOT)

Description:

The cross code consists of two main parts: Part I, Instructional Programs Related to Occupations, and Part II, Occupations Related to Instructional Programs. Part I contains a list summarizing and coding the substantive content of defined vocational-technical education programs which are included in the Standard Terminology For Curriculum And Instruction In Local And State School Systems, related to codes, titles, and worker trait groups in the Dictionary Of Occupational Titles, Third Edition. Part II contains a list which shows the Dictionary codes, titles, and worker trait groups related to codes and titles of vocational-technical education programs.

Part I of the cross-code is a six-column listing of coded and defined vocational-technical education instructional programs related to codes, titles, and worker trait groups in the Dictionary Of Occupational Titles. Instructional programs offered in the seven recognized vocational education areas have been identified, classified, and defined. Generally, the descriptions of the instructional programs represent composites of subject matter. In addition, it should be noted that the programs are not associated with any particular level of education, e.g., secondary, adult, but rather are general descriptions which are intended to be related to one or more levels when data are gathered about them.

Part II provides convertibility from specific Dictionary titles and codes to the corresponding vocational education instructional programs. The nine-digit codes are listed in the left hand column in numerical order followed by the job titles, industry designations, and worker trait group page numbers. The corresponding instructional program code numbers and titles are listed in the right hand columns.

Part II provides the means for improving the usefulness of those data in program planning by showing the specific vocational education programs that relate to the Dictionary code numbers and job titles used by State employment services in compiling information on current and projected employment.

Limitations:

- Developed in 1969 therefore cross code is outdated.
- Cross code was never empirically tested for validity
- Demand data is usually available by Census or OES codes, not DOT

OIS Application(s):

Supply-Demand interface - A method for matching supply data in USOE codes to demand data by DOT occupational titles.

Technical References:

Vocational Education And Occupations, Office of Education, DHEW, July 1969

CROSS CODE: Vocational Preparation and Occupations (Census-DOT-OES-SOC-USOE)

Description:

The manpower and vocational education planner, as well as the occupational counselor, has been faced with the problem of how to effectively use the information available from the DOT, USOE and Census Coding Systems. In order to respond to accountability requirements, administrative requests and routine planning functions, these planners must collect, analyze and utilize data from a variety of sources. Because different agencies collect and compile information for different purposes, using these different coding systems, the data obtained from one agency is not always directly comparable with that of another agency.

Lack of association between the systems was further emphasized when the Department of Labor and State Employment Security agencies began preparing and publishing manpower reports, also known as Industry-Occupational Matrices (IOM). The Bureau of Census Occupational titles and codes used in these matrices were not familiar to most planners so a new tool was needed to facilitate interpretation.

More recent State and Federal legislation requires that manpower and vocational education training programs be planned taking occupational demand and supply information into consideration. This requirement also clearly indicates the need for a linkage of the Department of Labor manpower reports and the occupational training program data prepared by the Office of Education.

In 1976, a Cross-Code Index was devised in California to link the three primary coding systems. It contained information pertaining to approximately 220 USOE codes, 441 Census codes and 14,200 base and defined related occupational titles from the DOT.

The Cross-Code Index was designed to correlate and report occupational information and facilitate occupational demand and supply comparisons. Occupational demand is reported by Census groups while occupational supply data is reported by USOE codes which are further defined by DOT codes and titles. The Cross-Code index identified and displayed the relationships between these three codes. It enabled planners and counselors to make better use of the Cross-Code Index to relate occupational demand information (as provided in the IOM) to vocational education program enrollments for a given geographic area. This information served as one indicator for determining whether or not to initiate a new vocational education program. Occupational counselors have used the Cross-Code Index to explain the relationship of academic and vocational education to the actual skill requirements of specific occupations.

Since this index was produced, the DOT has undergone a major revision in its classification structure. Legislation which bears on the issues of supply/demand information has been passed, specifically the Education Amendments of 1976 (P.L. 94-482), the Comprehensive Employment and Training Amendments Act of 1979 (P.L. 94-524) and the Youth Employment and Demonstration Projects Act of 1977 (P.L. 95-93). Improvements have also been made in the collection, analysis and dissemination of labor supply and demand data.

The 1976 Education Amendments also mandate the establishment of two information systems. These are (1) the Vocational Education Data System (VEDS) which is to be operated by the National Center for Educational Statistics (NCES) and the Occupational Information System (OIS) which is to be sponsored by the

National Occupational Information Coordinating Committee (NOICC). These information systems are to provide all the necessary data for State and National program and services planning and evaluation. Congress stipulated that these two information systems are to be compatible. Data extracted from one system should be comparable to that from the other system to make possible marched planning, accounting and evaluation activities.

Additionally, Congress requires that the USOE program codes be justaposed with the Standard Occupational Classification (SOC) codes. In addition, the CETA Amendments of 1978 state that procedures be established for uniform reporting of enrollments, completions and job placements by prime sponsors using the Standard Occupational Classification codes.

This publication consists of two volumes; *Volume I, Occupational and Education Crosswalks* and *Volume II, Index to the Occupational and Education Code Crosswalk*. Volume I contains descriptions and codes of vocational-technical education programs related to codes and titles from the *Dictionary Of Occupational Titles* (DOT) Fourth Edition, the Census Classification, the Occupational Employment Statistics (OES) Classification and the Standard Occupational Classification (SOC). In addition, data for General Education Development (GED), Specific Vocational Preparation (SVP), physical demands, working conditions and industry designations derived from job analysis information used to prepare the DOT are included. Volume II contains a tripartite index showing the classification systems, with the exception of the DOT codes and titles, in three different configurations in relation to the U.S. Office of Education code structure. References are made to the DOT code and titles by page number.

The coding systems have been arranged into three sets of tables. Each table is identified by a primary coding system (OES, Census or SOC) and shows the relationships to the other classification systems in the following manner.

1. OES Code & Title
   Census Code & Title   SOC Code & Title   OE Code & Title   Volume 1, pg.

2. Census Code & Title
   OES Code & Title   SOC Code & Title   OE Code & Title   Volume 1, pg.

3. SOC Code & Title
   OES Code & Title   Census Code & Title   OE Code & Title   Volume 1, pg.

In addition to showing how these codes are related to one another, the tables also indicate the page number in Volume 1 of this publication where additional DOT information can be found for those codes with a vocational education USOE code relationship. All three tables are in ascending numerical order of the major code for that section (i.e., the OES section is in OES ascending order, etc.). Within the OES major section, for each OES code, the relationships are listed in SOC ascending order. Within the other two sections, for each major code, the relationships are in OES ascending order.

Limitations:

- The structure of the various occupational and educational classification systems does not allow a one-to-one matching of the several systems

- Lack of employment data by DOT makes it difficult to distinguish between the importance of the various DOT occupations within a particular USOE program category

OIS Application(s):

Supply/Demand Interface: A mechanism for matching supply data to demand data.

Technical References:

Vocational Prepatation And Occupation--Volume 1, Occupational And Educational Code Crosswalk, (Interim Edition) presented by NOICC, 1979.

Vocational Preparation And Occupations--Volume 2, Index To The Occupational And Educational Code Crosswalk, (Interim Edition) presented by NOICC, 1979.

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THE HAWAII OCCUPATIONAL INFORMATION SYSTEM

VOLUME III:

The Hawaii Occupational Information System Data and Information Sources

VOLUME III

HSOICC

HAWAII STATE OCCUPATIONAL INFORMATION COORDINATING COMMITTEE

THE HAWAII OCCUPATIONAL INFORMATION SYSTEM HANDBOOK:

ANALYSIS OF SUPPLY AND DEMAND

APRIL, 1981

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1 INTRODUCTION TO OCCUPATIONAL INFORMATION ANALYSIS

OBJECTIVES OF OCCUPATIONAL INFORMATION ANALYSIS

Volumes I-IV and The Supplement to Volume I of the *Hawaii Occupational Information System (HOIS)* focus on occupational information development. Those volumes contain descriptive detail on the reporting systems, survey programs, and other data collection efforts that provide the information necessary for the HOIS. In contrast, this volume of the *HOIS Handbook* presents a process and techniques for the analysis, presentation, and delivery of occupational information.

The occupational information analysis process described here is intended to assist State and local agencies responsible for the provision of occupational information in meeting two primary objectives:

- To provide occupational supply/demand information, occupational characteristics information, and analysis to administrators and planners to support the decision-making process for vocational education and employment and training program planning
- To provide employment outlook information based on occupational supply/demand relationships and occupational characteristics information to support the decision-making process of individuals making career choices

Occupational information analysis is one of the most complex data analysis processes in the field of labor market information. Information sources used in the analytical process vary widely in their population coverage, time period specificity, and geographic area coverage. Also, various classification systems are used for the collection and tabulation of this information. Finally, many of these reporting systems or survey programs exist primarily for internal program management purposes or to satisfy Federal, State, or local reporting requirements, rather than to provide occupational information.

This volume is an effort to provide an analysis process that takes into consideration those data constraints. The discussions are focused on using currently available data, with recognition of its limitations; the underlying concept here is that information currently, *systematically* available can, in fact, be used to develop supply/demand analysis products that are useful. The user of the *Handbook* must select from among alternatives the procedures most appropriate to the available data. Finally, it is recognized that the use of occupational supply/demand analysis products will vary according to the specific planning processes of different user agencies. The OIS design in each State should be developed to serve each of these planning processes to the extent allowed by the available data and resources.

Regardless of the data constraints and variations in specific user needs, the users of the HOIS Handbook are urged to keep the objectives noted above at the forefront throughout the analysis process. They should also recognize that achieving these objectives will require emphasis on the analysis and interpretation of supply/demand information, rather than on statistical presentation of supply/demand data, particularly in view of the limitations of available data for supply/demand matching and the need of users for understanding and properly applying this information in their decisionmaking.

The remainder of this chapter provides an orientation to the supply/demand analysis process and procedures presented in this volume. The chapter includes an overview of supply/demand analysis, a discussion of the role of supply/demand analysis in an OIS, a description of three types of supply/demand analysis products, an introduction to technical issues in supply/demand analysis, and a review of the policies of NOICC and its member agencies that are relevant to development of an OIS. Finally, this chapter presents an overview of the remaining chapters.

OVERVIEW OF OCCUPATIONAL SUPPLY/DEMAND ANALYSIS

From a classical economics viewpoint, the number of individuals available and willing to work in an occupation at a given wage (supply) affects an employer's decision to hire workers in that occupation (demand). Similarly, the demand for workers at a given wage affects the number of individuals willing to enter an occupation. Many factors, both economic and noneconomic, complicate the study of the interaction of supply and demand for workers. Neither employers nor workers always behave in strict adherence to classical economic principles nor do they have complete and accurate knowledge of the job market.

In an ideal situation, complete and consistent information on current and projected job openings, current and projected labor market entrants and transfers, and data on earnings and other factors would be available to all users. This would permit an analysis of the balances and imbalances between the demand for and supply of workers. Comparisons of data on projected job openings and expected labor market entrants would indicate one of three outcomes: a supply/

demand balance (entrants equals openings), a shortage (entrants less than openings), or a surplus (entrants greater than openings). The implications of these outcomes for planning and career decisionmaking would be analyzed in greater depth through the use of occupational characteristics information and complementary information to interpret the supply/demand relationship. This analysis process, even in this ideal situation, would be very complex.

At the present time, however, all of the data needed for calculating and comparing job openings and entrants are not available. Also, procedures for conducting such comparisons are not standardized. Therefore, supply/demand comparisons must be prepared using incomplete information, while at the same time efforts are made to improve the required data and establish the necessary procedures.

ROLE OF OCCUPATIONAL SUPPLY/DEMAND ANALYSIS IN AN OIS

Given the current shortcomings in both data availability and procedures for conducting supply/demand comparisons, what is the purpose of the occupational supply/demand analysis within an OIS? This question is particularly important because the occupational supply/demand analysis is a necessary element of many OIS products. Briefly stated, the purpose of the analysis is to integrate available occupational and training preparation information to compare, display, and interpret occupational supply and demand data at State and sub-State levels covering time periods of interest for the users the OIS is mandated to serve.

There are two facets of this analysis--quantitative and qualitative. The quantitative aspect of the analysis focuses on the problems associated with interfacing information that is collected and tabulated using different classification systems. The result of the quantitative supply/demand analysis is very often (but not always) a table that summarizes the average annual openings for occupations and data on completers and/or individuals available from various related vocational education and employment and training programs and other sources of supply.

By contrast, the qualitative supply/demand analysis attempts to interpret or explain the results of the quantitative analysis. This is accomplished by analyzing factors such as the specific characteristics of an occupation, certain entry requirements or labor market patterns affecting the occupation, and proxy information for the supply/demand situation.

It cannot be too strongly emphasized that quantitative analysis _must_ be accompanied by qualitative analysis if the needs of occupation information users are to be served. Quantitative analysis alone is necessarily incomplete because of the lack of adequate data for several elements of supply and demand data. Even complete quantitative data, however, would not provide the user with all of the information necessary for decisionmaking purposes.

THREE LEVELS OF SUPPLY/DEMAND ANALYSIS PRODUCTS

The various types of supply/demand analysis products that can be developed may be conceptualized into three categories or "levels" of products. The hierarchy of three levels of products described below includes products of increasing scope, content, and sophistication of presentation:

- _Level 1--Summary Supply/Demand Data Presentation by Occupation or Program Category_--Products at this level generally are limited to tabular presentation of supply and demand data, including relatively few supply sources and, rarely, limited characteristics information. Coverage may be limited to State-wide data and use of a single classification structure. These products do not provide analysis and interpretation and do not describe the sources of data and procedures used for comparing supply and demand data.

- _Level 2--Detailed Supply/Demand Data Presentation Indicating Occupation-Program Relationships with Some Use of Characteristics Information and Explanatory Text_--These products indicate the interrelationships between occupations and program categories in a table format. Supply information is shown for a broad range of sources, and is shown by source; occupational characteristics information may also be shown. Accompanying discussion describes procedures used in developing the information, and its limitations and uses. These products may provide some general interpretive analysis for broad program or occupational areas.

- _Level 3--Supply/Demand Analysis and Interpretation with Detailed and Summary Data Displays_--Level 3 products provide analysis and interpretation of supply/demand relationships, usually in a narrative form, using occupational characteristics and complementary information. These products present detailed and summary data in various table formats and may integrate such information into the narrative. They reflect supply and demand data from as broad a range of sources as possible and show detailed information for each source. These products also describe the procedures used in developing the information and its limitations and uses.

The three OIS supply/demand analysis product levels are intended to establish a frame of reference for OIS development. Every State has a product that conforms to Level 1 because this type of supply/demand product is included in the State's Annual Plan for Vocational Education. Many States also have products that are similar to the Level 2 description that are developed as part of the Labor Market Information program by the State Employment Security Agency (SESA). There presently are, however, very few supply/demand analysis products that resemble the Level 3 features. Exhibit 1-1, on the following page, summarizes the features of supply/demand analysis products at each level.

The intent of HSOICC and its statutory agencies is that occupational supply/demand information produced through an OIS should not simply be presented in tabular formats with no explanation or interpretation of what that supply/demand information means. Simply stated, a table with quantitative supply/demand information should not be considered a final product. Narrative interpretation and explanation of tabular information should accompany tabular displays of supply/demand information to avoid inappropriate conclusions that may be drawn from the quantitative data.

INTRODUCTION TO TECHNICAL ISSUES IN SUPPLY/DEMAND ANALYSIS

The preceeding discussion and the variety of information sources described in Volume 1 of this Handbook indicate the range of technical issues that must be faced in conducting supply/demand analysis. These issues may be described in four major categories: classification issues, geographic issues, time period issues, and measurement issues. Because these four categories provide one of the organizing structures for the remainder of this volume, a brief overview of each issue is provided here. Each of these four issues has a corresponding section in Chapter 4 providing procedures for dealing with the issue in the supply/demand analysis process. A fifth issue, interpretation and explanation, is the subject of Chapter 5.

- Classification Issues- Data from available sources of information are collected and tabulated using various classification systems. Some of these classification systems are for industries, some for occupations, and some for educational programs or disciplines. Given the different classification systems that are used to summarize detailed data, how can information from the different available data sources be interrelated? Stated differently, how should classification system differences be resolved for occupational supply/demand analysis?

Issues relating to classification of supply/demand information also focus on the need to reflect different relationships among occupations and vocational education and employment and training programs. For example, certain computational steps are necessary to adjust for problems arising from the following situations:

- An education/training program may prepare an individual for a specific occupation or a broad group of occupations. How can the supply information pertaining to entrants from education/training programs be allocated to the demand information representing different occupational fields in the supply/demand analysis process?
- Preparation for entry into an occupation may be either from a very specific education/training program or from one of several related education/training programs. How can the demand information pertaining to occupations be allocated to the supply information representing different education/training programs in the supply/demand analysis process?

- Geographic Area Issues--Data from available sources of information represent different geographic areas in terms of coverage. These varying area coverages present difficulties in attempting to integrate information for an occupational supply/demand analysis. Since different geographic areas are represented for each data source and different aggregations or disaggregations of information may be possible, for what geographic areas should occupational supply/demand information be developed? What kinds of problems arise in attempting to integrate information from sources of information that represent different and sometimes overlapping geographic areas?

- Time Period Issues--Data from available sources of information cover different time periods, are generated at varying frequencies, and have differing time delays between the actual collection and reporting of information and the availability of that information for acquisition. Given these various constraints in the time period coverage and the frequencies and/or delays in information availability, for what time periods should supply/demand information be developed? In many instances this time period anlaysis is determined by the timing constraints associated with acquiring information from data producers.

- Measurement Issues--Perhaps the most complex data issues to be dealt with in the quantitative aspect of supply/demand analysis are those issues that focus on the actual measurement of occupational demand and occupational supply, and relate to the numerical calculations or computation of the supply/demand information. Issues relating to the measurement of occupational demand and supply include:

  - What measures can be used to estimate current job vacancies? What are the limitations of these measures?

  - What measures can be used to estimate job openings over a long-term projection period? What are the shortcomings of these measures?

  - What measures can be used to estimate the occupational supply subcomponent "entrants from education/training program"? Enrollment, completion, and follow-up information provide different measures. How can overlaps among reporting systems and survey programs be eliminated in measuring this occupational supply subcomponent?

  - What measures can be used to estimate the "job-seekers" component of occupational supply? How can overlaps in reporting systems be eliminated in measuring this subcomponent?

- Interpretation/Explanation Issues--After the quantitative aspects of supply/demand analysis have been completed, there still remains another element of the supply/demand analysis to be conducted--the qualitative analysis. This process results in an explanation of the quantitative supply/demand information and interpretation of the possible implications or reasons for the information. Several issues are associated with the qualitative analysis, including:

- Relative comparisons among occupational fields or vocational education/employment and training program areas as to which have the most potential for existing programs or even new programs in terms of predicted labor market success of program completers
- Characteristics of occupations that identify the relevance of vocational education/employment and training programs to entry into related occupational fields
- Characteristics of occupations that are useful in interpreting the quantitative supply/demand relationship (e.g., job stability, turnover/new hires, wages and earnings, working conditions)
- Measures of labor market activity that can provide proxy indicators of occupational supply/demand balances or imbalances (e.g., placement rates, industry growth patterns, emerging occupations), or that can be used in conjunction with supply/demand information

OIS INFORMATION BASE REVISITED

Volume 1 presented an exhibit entitled "OIS Information Base and the Two Major Uses of Occupational Information." That exhibit, repeated as Exhibit 2-1, appears on the following page. Exhibit 2-1 presents the conceptual structure of the OIS Information Base, but does not indicate the availability of data within each of the information base categories. From an operational viewpoint and to facilitate analysis, the available data need to be organized according to commonalities of data sources that are the best measures of the data categories. This new grouping, thereby differs from the Volume 1 grouping by providing an OIS subcomponent structure that will become the basis of procedural options for the development of quantitative and qualitative occupational supply/demand analysis.

OIS SUBCOMPONENT STRUCTURE

The OIS subcomponent structure, as explained above, is based upon common characteristics of data sources in terms of how the data suppliers actually measure the conceptual data categories reflected in Exhibit 2-1. Exhibit 2-2, following Exhibit 2-1, presents the OIS subcomponent structure and indicates which of the data categories in the conceptual OIS Information Base are included in each of the indicated OIS subcomponents. Within each of the OIS subcomponents, information should be maintained at the finest level of detail whenever possible. This allows for analytical flexibility through a variety of aggregations of data and hence the examination and comparison of different interrelationships. The process of maintaining information at this finest level of detail will be carefully explained within the discussion of each subcomponent. Each OIS subcomponent is discussed in the following sections in terms of the reasons or common basis for linking data sources together.

The OIS subcomponents of occupational demand and occupational supply are the basis for the procedures associated with the quantitative occupational supply/demand analysis. The issues and procedures in Chapter 4 focus principally on these four OIS subcomponents and the process of interfacing occupational supply and demand measures. By contrast, the OIS subcomponents of occupational characteristics and complementary information are used primarily in the occupational supply/demand analysis interpretation and explanation process in Chapter 5. Understanding the subcomponent structure of occupational demand and occupational supply is critically important to the use of this volume because the structure represents a departure from the OIS Information Base in Volume 1. This structure, however, has been created in recognition of the data sources that can be used systematically for occupational supply/demand analysis.

EXHIBIT 2.1
Page 2-2

OIS INFORMATION BASE AND THE TWO MAJOR USES OF OCCUPATIONAL INFORMATION

OCCUPATIONAL INFORMATION BASE

1. INTRODUCTION

2. OCCUPATIONAL DEMAND
  2.1 CURRENT OCCUPATIONAL DEMAND
    2.1.1 CURRENT OCCUPATIONAL EMPLOYMENT
    2.1.2 JOB VACANCIES
  2.2 PROJECTED OCCUPATIONAL DEMAND
    2.2.1 PROJECTED OCCUPATIONAL DEMAND--LONG TERM
    2.2.2 PROJECTED OCCUPATIONAL DEMAND--SHORT TERM
  2.3 OCCUPATIONAL TRANSFERS AND GEOGRAPHIC MIGRATION
    2.3.1 OCCUPATIONAL TRANSFERS
    2.3.2 GEOGRAPHIC MIGRATION

3. OCCUPATIONAL SUPPLY
  3.1 CURRENT OCCUPATIONAL SUPPLY
    3.1.1 CURRENT OCCUPATIONAL EMPLOYMENT
    3.1.2 CURRENT UNEMPLOYMENT BY OCCUPATION
  3.2 ENTRANTS TO OCCUPATIONAL SUPPLY FROM EDUCATION/TRAINING PROGRAMS
    3.2.1 ENROLLEES, COMPLETERS, AND LEAVERS
    3.2.2 FOLLOW-UP SURVEYS AND STUDIES
  3.3 OTHER SOURCES OF ENTRANTS TO OCCUPATIONAL SUPPLY
    3.3.1 AGENCY REGISTRANTS
    3.3.2 NEW ENTRANTS AND REENTRANTS TO CIVILIAN LABOR FORCE
  3.4 OCCUPATIONAL TRANSFERS, GEOGRAPHIC MIGRATION, AND LABOR FORCE SEPARATIONS
    3.4.1 OCCUPATIONAL TRANSFERS
    3.4.2 GEOGRAPHIC MIGRATION
    3.4.3 LABOR FORCE SEPARATIONS

4. OCCUPATIONAL CHARACTERISTICS
  4.1 NATURE OF THE OCCUPATION
    4.1.1 TITLES, DEFINITIONS, AND DUTIES
    4.1.2 MACHINES, TOOLS, EQUIPMENT, AND WORK AIDS (MTEWA)
    4.1.3 MATERIALS USED, PRODUCTS MADE, SUBJECT MATTER DEALT WITH, OR SERVICES RENDERED (MPSMS)
    4.1.4 RELATED OCCUPATIONS AND CLUSTERS
  4.2 WORKING CONDITIONS
    4.2.1 ORGANIZATIONAL ENVIRONMENT
    4.2.2 PHYSICAL ENVIRONMENT
    4.2.3 SCHEDULE AND HOURS
  4.3 PERSONAL REQUIREMENTS
    4.3.1 INTERESTS
    4.3.2 TEMPERAMENTS
    4.3.3 APTITUDES AND ABILITIES
    4.3.4 PHYSICAL DEMANDS AND CAPABILITIES
  4.4 EDUCATION AND TRAINING REQUIREMENTS
  4.5 LICENSING, CERTIFICATION, AND REGISTRATION REQUIREMENTS
  4.6 METHODS OF EXPLORATION, ENTRY, AND ADVANCEMENT
    4.6.1 METHODS OF EXPLORATION AND GAINING EXPERIENCE
    4.6.2 METHODS OF ENTRY
    4.6.3 METHODS OF ADVANCEMENT
  4.7 EARNINGS AND FRINGE BENEFITS
    4.7.1 FACTORS AFFECTING EARNINGS
    4.7.2 NATIONAL, STATE, AND LOCAL EARNINGS
    4.7.3 FRINGE BENEFITS
    4.7.4 SUPPLEMENTAL INCOME
  4.8 EMPLOYMENT PROFILE
    4.8.1 OCCUPATIONAL DEMOGRAPHICS
    4.8.2 JOB STABILITY
    4.8.3 TURNOVER/NEW HIRES
    4.8.4 INDUSTRIAL CONCENTRATION
    4.8.5 DEGREE OF UNIONIZATION
  4.9 INFORMATION SOURCES
    4.9.1 PRIMARY SOURCES
    4.9.2 SECONDARY SOURCES
    4.9.3 BIBLIOGRAPHICAL SOURCES

5. COMPLEMENTARY INFORMATION
  5.1 EDUCATION AND TRAINING AUXILIARY INFORMATION
    5.1.1 EDUCATION AND TRAINING INSTITUTIONS
    5.1.2 EDUCATION AND TRAINING PROGRAMS
    5.1.3 FINANCIAL ASSISTANCE PROGRAMS
  5.2 DEMOGRAPHICS AND ECONOMIC CONDITIONS
    5.2.1 DEMOGRAPHICS
    5.2.2 LABOR FORCE, EMPLOYMENT, AND UNEMPLOYMENT TRENDS
    5.2.3 LABOR TURNOVER AND COMMUTING PATTERNS
  5.3 OTHER STATE-IDENTIFIED INFORMATION

6. AUXILARY INFORMATION NECESSARY TO SUPPORT OCCUPATIONAL SUPPLY/DEMAND ANALYSIS (SEE VOLUME 2)

TO SUPPORT THE PLANNING PROCESS FOR EDUCATION AND TRAINING PROGRAMS

USERS

PLANNERS AND ADMINISTRATORS

TO SUPPORT THE CAREER PLANNING, GUIDANCE, AND JOB SEARCH NEEDS OF VARIOUS TARGET POPULATIONS

USERS

DIRECT PARTICIPANTS IN THE LABOR MARKET

LABOR MARKET INTERMEDIARIES

OIS COMPONENTS AND SUBCOMPONENTS

OCCUPATIONAL DEMAND

- Current and Short-Term Demand
  - Current Occupational Employment (2.1.1)
  - Job Vacancies (2.1.2)
  - Projected Occupational Demand--Short-Term (2.2.2)
- Long-Term Demand
  - Projected Occupational Demand--Long-Term (2.2.1)

OCCUPATIONAL SUPPLY

- Entrants from Education/Training Programs
  - Enrollees, Completers and Leavers (3.2.1)
  - Follow-up Surveys and Studies (3.2.2)
- Jobseekers
  - Current Unemployment by Occupation (3.1.2)
  - Agency Registrants (3.3.1)
  - New Entrants and Re-entrants to Civilian Labor Force (3.3.2)

OCCUPATIONAL CHARACTERISTICS

- Working Conditions (4.2)
  - Organizational Enviornment (4.2.1)
  - Physical Environment (4.2.2)
  - Schedule and Hours (4.2.3)
- Education and Training Requirements (4.4)
- Licensing, Certification and Registration Requirements (4.5)
- Methods of Exploration, Entry and Advancement
  - 4.6.1 Methods of Exploration and Gaining Experience
  - 4.6.2 Methods of Entry
  - 4.6.3 Methods of Advancement
- Earnings and Fringe Benefits (4.7)
  - Factors Affecting Earnings (4.7.1)
  - National, State, and Local Earnings (4.7.2)
  - Fringe Benefits (4.7.3)
  - Supplemental Income (4.7.4)
- Employment Profile (4.8)
  - Occupational Demographics (4.8.1)
  - Job Stability (4.8.2)
  - Turnover/New Hires (4.8.3)
  - Industrial Concentration (4.8.4)
  - Degree of Unionization (4.8.5)

COMPLEMENTARY INFORMATION (PROXIES)

- Placement Information
  - Follow-up Surveys and Studies (3.2.2)
- Labor Turnover
  - Turnover/New Hires (4.8.3)
  - Labor Turnover and Commuting Patterns (5.2.3)
- Employment and Unemployment Trends
  - Labor Force, Employment, and Unemployment Trends
- Industrial Concentration
  - Current Occupational Employment (2.1.1)
  - Industrial Concentration (4.8.4)
- Applicants to Openings Trends
  - Job Vacancies (2.1.2)
  - Agency Registrants (3.3.1)

Note: Numbers in parentheses refer to section and table numbers in Volume 1.

EXHIBIT 2-2
OIS SUBCOMPONENT STRUCTURE
Page 2-3

3 OIS DEVELOPMENT PROCESS

INTRODUCTION

The purpose of this chapter is to describe a process that can be used to develop OIS supply/demand products. The process described in this chapter provides the organizational logic for the remaining chapters in this volume. The development process can be broadly described as a means by which product(s) that reflect occupational supply/demand information and analysis can be produced to meet user needs given the coverage and constraints of existing data sources. The process described reflects the four issue areas and the supply/demand subcomponent structure described in the previous chapters. The following table summarizes the issue areas and OIS subcomponents, as a review of Chapters 1 and 2.

Table 3-1: OIS Subcomponents and Issue Areas

OIS Subcomponents

- Current and Short-Term Demand
- Long-Term Demand
- Entrants from Education/Training Programs
- Jobseekers
- Occupational Characteristics
- Complementary Information and Proxy Indicators of Supply/Demand Relationships
- Supply/Demand Interface

OIS Issue Areas

- Classification
- Geographic Area
- Time Period
- Measurement

It should be noted that this process is parallel to NOICC's OIS Development Strategy contained in NOICC Administrative Memorandum 80-4 (April 18, 1980). The strategy addresses the logic of developing an OIS. While this chapter is more narrowly focused, identifying the development plan for an OIS supply/demand product, it describes a process consistent with NOICC's broader OIS development strategy which encompasses career information and training aspects of OIS as well as supply/demand development and delivery.

The development process is presented in this chapter to establish the frame of reference for subsequent chapters. Associated with many of the steps in the development process is the need to consider certain data issues and to apply the appropriate procedures to deal with these issues. The issues and procedures are not included in this chapter, but instead are presented in Chapter 4. In addition to the procedures that are necessary to consider for the data issues, there are also supply/demand analytical applications that are important considerations for certain steps in the development process. These analytical applications are discussed in Chapter 5. Lastly, delivery and training strategies must be considered. These aspects of supply/demand product(s) development are covered in Chapter 6.

Each step in the development process is carefully linked to specific other sections in this volume. A reference table at the end of the discussion of each step indicates which sections of the volume need to be considered in the conduct of specific activities as part of that step in the development process. Unfortunately, the issues and procedures in Chapter 4 and the supply/demand analytical applications in Chapter 5 may be referred to in more than one step in the development process in this chapter. For example, a given issue and procedure might be referenced in several steps in the development process. These multiple references would suggest that the development process does not consist of discrete steps, but consists of steps that require constant reassessment of the development status of supply/demand analysis products. The development process, therefore, is an iterative one which may require the consideration of a given procedure at several steps in the development process to assure that the procedure is applicable.

Over time the references between the development steps in this chapter and (1) the issues and procedures in Chapter 4, and (2) the supply/demand analytical applications in Chapter 5 should become clearer. This can only be accomplished, however, through feedback provided by users of this developmental process. Understanding the linkages between this chapter and the other chapters of this volume, particularly Chapters 4 and 5, is critical to the use of this volume. The user is encouraged, therefore, to carefully study this linkage before attempting to use the development process.

OIS DEVELOPMENT PHASES

The OIS product development process includes five phases, as described below:

- Definition of Occupational Information Needs and Sources--The purpose of this phase is to determine for each of the issue areas both the needs of the data users and the features of existing data resources.
- Specification of the OIS Product(s)--The purpose of this phase is to use the results of the definition of the needs and sources phase to determine the content, structure, and coverage of proposed final product(s), the data resources to be used, and the procedures to be used to process the data.
- Information Acquisition and Processing--This phase includes acquiring and processing data to be included in the final product. The processing of the data involves performing the procedures identified in the previous phase.
- Information Analysis and Interpretation--The purpose of this phase is to examine the supply/demand data derived in the previous phase and indicate the relationships and trends that are suggested. Qualitative factors, such as occupational characteristics or proxy indicators of supply/demand relationships, can be used to help interpret and explain the supply/demand data.
- Dissemination of the OIS Product(s)--This phase includes the dissemination of the OIS product and any technical assistance or training provided for its use.

These phases are expanded into 11 OIS Product Development Steps detailing the specific activities in each phase.

Exhibit 3-1 presents each of the five phases (left-hand column) and the associated OIS product development step (center column). The remainder of this chapter describes the steps in the developmental process. The format used to present each step in the development process is similar and covers the following topics:

- Objectives--The intended goals or objectives of the developmental step
- Inputs--The data inputs, resource materials, or previously developed products that are needed for the activities associated with this step

- Activities--The actual activities that are associated with each developmental step

- Resulting Products--The products that result from the completion of the activities associated with the step

EXHIBIT 3-1
SUMMARY OF OIS PRODUCT DEVELOPMENT
STEPS AND VOLUME 2 ORGANIZATION
Page 3-5

Phase	OIS Product Development Step	Volume V Coverage
1. Definition of the Occupational Information Needs and Sources	1. Identify and analyze the occupational information needs of users.	Chapter 4--See the "User Needs" discussion within each issue.
	2. Identify and analyze existing programs and data sources that could provide information for an OIS.	Chapter 2--See the discussion of State Information Development Chapter 4--See the "Data Source Coverage" discussion within each issue and subcomponent.
2. Specification of the OIS Product(s)	3. Determine what OIS supply/demand products will be developed or improved.	Chapter 4--See the "Problem Statement" discussion within each issue and subcomponent.
	4. Determine what sources of information will be used for the development of supply/demand information for proposed products.	Chapter 4--See the "Data Source Coverage Tables" within each issue and subcomponent.
	5. Determine the specifications of the supply/demand products that will be developed.	Chapter 4--See the discussions of "Classification Issues" and "Units of Analysis."
	6. Determine what procedures must be dealt with to develop a specific supply/demand product.	Chapter 4--See the "Solutions" listed for each problem which are shown by issue and subcomponent.
3. Information Acquisition and Processing	7. Acquire information from producing agencies.	Chapter 2--See the discussion of the Summary of Available OIS Information.
	8. Develop quantitative supply/demand information for supply/demand products.	Chapter 4--See procedural steps for appropriate option selected as the solution to a given problem.
4. Information Analysis and Interpretation	9. Provide an initial explanation of what the quantitative supply/demand information means.	Chapter 5--See the discussion of the "Initial Explanation of the Quantitative Supply/Demand Information."
	10. Analyze and interpret the quantitative supply/demand information through qualitative analysis.	Chapter 5--See the discussion of the use of occupational characteristics information and proxy indicators of supply/demand relationships in Sections 5.2 to 5.4.
5. Dissemination of the OIS Product(s)	11. Finalize the supply/demand products, implement a delivery strategy for disseminating the product, and conduct training activites.	Chapter 6--See the discussion of Occupational Information Delivery.

4 QUANTITATIVE ANALYSIS—ISSUES AND PROCEDURES

INTRODUCTION

The purpose of this chapter is to provide a detailed discussion of the procedures that can be used to address the issues and problems involved in supply/demand analysis. These problems occur in the process of designing and developing a supply/demand product that has the following features:

- The product integrates data from a variety of programs and data sources
- The product reconciles user needs and preferences for occupational information with available data sources

The resolution of these problems is covered in the OIS Development Process in the following steps:

- Step 3--Determine what OIS supply/demand products will be developed or improved.
- Step 4--Determine what sources of information will be used for the development of supply/demand information for proposed products.
- Step 5--Determine the specifications of the supply/demand products that will be developed.
- Step 6--Determine what procedures must be dealt with to develop a specific supply/demand product.
- Step 7--Develop quantitative supply/demand information for supply/demand products.

Chapter 3 discussed these steps in detail and cross-referenced each step to specific sections in Chapter 4. This chapter is subdivided into the four issue sections. Each section is presented in a standard format that covers the problems associated with each data subcomponent, alternative solutions for each problem, and procedural steps for each alternative solution. The four issue areas are briefly reviewed below:

- Classification Issues (Section 4.1)--Data from available sources of information are collected and tabulated using various classification systems. Some of these classification systems are for industries, some for occupations, and some for educational programs or disciplines. Given the different classification systems that are used to summarize detailed data, how can information from the different available data sources be interrelated? Stated differently, how should classification system differences be resolved for occupational supply/demand analysis?

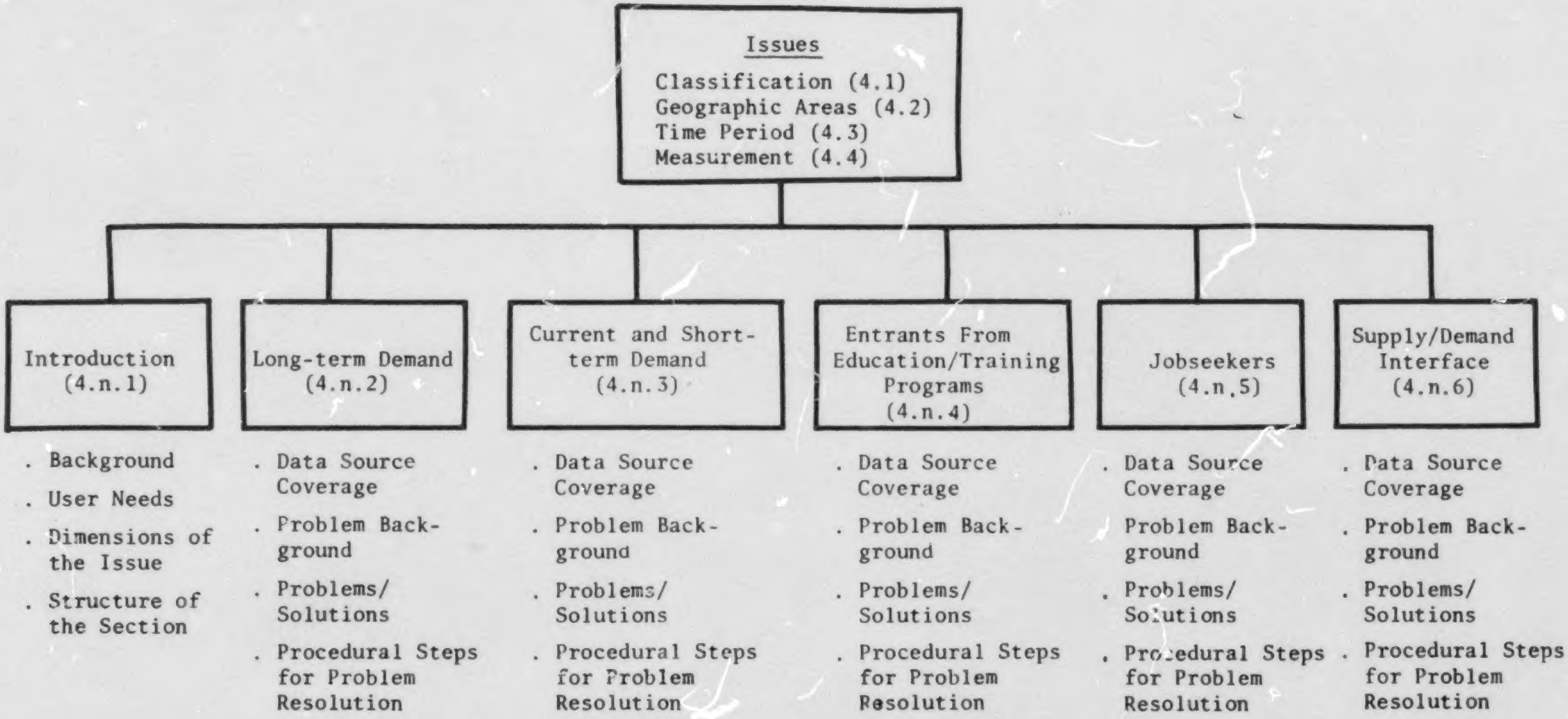
- Geographic Area Issues (Section 4.2)--Available sources of information represent different geographic areas in terms of coverage. These varying area coverages present difficulties in attempting to integrate information for an occupational supply/demand product. Since different geographic areas are represented for each data source and different aggregations or disaggregations of information may be possible, for what geographic areas should occupational supply/demand information be developed? What kinds of problems arise in attempting to integrate information from data sources that represent different and sometimes overlapping geographic areas?

- Time Period Issues (Section 4.3)--Available sources of information (1) cover different time periods, (2) are generated with varying frequency, and (3) have differing time delays between the actual collection and reporting of information and the availability of that information for acquisition. Given these various constraints in the time period coverage and the frequency of and/or delays in information availability, for what time periods should supply/demand information be developed? In many instances this time period analysis is determined by the timing constraints associated with acquiring information from data producers.

- Measurement Issues (Section 4,4)--An additional set of data issues to be dealt with in the quantitative aspect of supply/demand analysis are those that focus on: (1) the conceptual measurement of occupational demand and occupational supply, (2) the extent to which various data sources cover the universe of the occupational supply and demand data components, including possible gaps, and (3) the existence of possible duplication in coverage among different data sources.

A detailed discussion of each issue and related problems and solutions is presented within each section. A standard structure is used in the discussion of each issue. This structure is graphically displayed in Exhibit 4-1 and described on the page following the exhibit.

EXHIBIT 4-1
STRUCTURE OF ISSUE DISCUSSION
IN CHAPTER 4


Issues
Classification (4.1)
Geographic Areas (4.2)
Time Period (4.3)
Measurement (4.4)
Introduction (4.n.1)
. Background
. User Needs
. Dimensions of the Issue
. Structure of the Section
Long-term Demand (4.n.2)
. Data Source Coverage
. Problem Background
. Problems/Solutions
. Procedural Steps for Problem Resolution
Current and Short-term Demand (4.n.3)
. Data Source Coverage
. Problem Background
. Problems/Solutions
. Procedural Steps for Problem Resolution
Entrants From Education/Training Programs (4.n.4)
. Data Source Coverage
. Problem Background
. Problems/Solutions
. Procedural Steps for Problem Resolution
Jobseekers (4.n.5)
. Data Source Coverage
Problem Background
. Problems/Solutions
. Procedural Steps for Problem Resolution
Supply/Demand Interface (4.n.6)
. Data Source Coverage
. Problem Background
. Problems/Solutions
. Procedural Steps for Problem Resolution

Note: n = the individual section covering each issue:

1 = Classification
2 = Geographic Area
3 = Time Period
4 = Measurement

- Introduction--Each issue is introduced with a discussion of the following items:
  - Background to the issue
  - Possible user needs related to the issue
  - Dimensions of the issue
  - Structure of the section

The following four sections are presented by OIS data subcomponent within each issue area:

- Data Source Coverage--The programs and data sources described in Volume 1 of this Handbook are assessed in this section in terms of their coverage of the dimensions of the issue.

- Problem Background--The types of problems associated with integrating data from different sources and relating them to user needs are described in this section.

- Problems/Solutions--This section presents specific problem statements along with possible solutions in a table format. It should be noted that the solutions are not presented in priority sequence; rather, the appropriateness of any of the solutions must be determined by the data availability and judgment of personnel in each State.

- Procedural Steps for Problem Resolution--The last section of each problem discussion is a presentation in table format of the series of procedural steps that need to be taken to use each of the proposed solutions. The "Procedural Steps for Problem Resolution" table provides comments and limitations associated with each step, as appropriate. The procedures focus on the use of available occupational information.

Exhibit 4-2 presents a table of contents for Chapter 4.

EXHIBIT 4-2
TABLE OF CONTENTS
FOR CHAPTER 4

Pages

4.1. Classification Issues

4.1.1 Introduction to Classification Issues 4.1-1
4.1.2 Long-Term Demand 4.1-11
4.1.3 Current and Short-Term Demand 4.1-21
4.1.4 Entrants from Education/Training Programs 4.1-25
4.1.5 Jobseekers 4.1-33
4.1.6 Supply/Demand Interface 4.1-36

4.2 Geographic Area Issues

4.2.1 Introduction to Geographic Area Issues 4.2-1
4.2.2 Long-Term Demand 4.2-6
4.2.3 Current and Short-Term Demand 4.2-11
4.2.4 Entrants from Education/Training Programs 4.2-19
4.2.5 Jobseekers 4.2-30
4.2.6 Supply/Demand Interface 4.2-36

4.3 Time Period Issues

4.3.1 Introduction to Time Period Issues 4.3-1
4.3.2 Long-Term Demand 4.3-7
4.3.3 Current and Short-Term Demand 4.3-14
4.3.4 Entrants from Education/Training Programs 4.3-21
4.3.5 Jobseekers 4.3-36
4.3.6 Supply/Demand Interface 4.3-41

4.4 Measurement Issues

4.4.1 Introduction to Measurement Issues 4.4-1
4.4.2 Long-Term Demand 4.4-4
4.4.3 Current and Short-Term Demand 4.4-7
4.4.4 Entrants from Education/Training Programs 4.4-16
4.4.5 Jobseekers 4.4-38

4.1 CLASSIFICATION ISSUES

4.1.1 INTRODUCTION

BACKGROUND

A variety of different classification systems are used to organize information about occupations, industries, or educational programs. Many of these classification systems were developed primarily by Federal agencies to carry out specific regulatory or administrative mandates. The classification systems are used for the purpose of efficiently collecting, processing, aggregating, and/or reporting specific data about specific programs. Some of the classification systems are agency-unique and apply to a specific program within an agency. As a result, the classification systems are fundamentally different in structure, coverage, and function. Some of the classification systems, however, are used on a very broad basis by a wide variety of users, such as the Dictionary of Occupational Titles (DOT) and the Standard Industrial Classification (SIC) systems.

Exhibit 4.1.1, on the following page, shows the major classification systems for occupations, industries, and educational programs or disciplines. These classification systems are used to collect or summarize detailed data from different administrative reporting systems, survey programs, or other information sources. The program in an OIS is how to relate information from different sources. These classification issues must be resolved in the process of developing occupational supply/demand analysis.

This section on Classification Issues is structured somewhat differently from the other sections in Chapter 4. Because the problem of relating different classification systems arises at the level of developing a supply/demand interface, that section (4.1.6) of the chapter contains the greatest number of problems and solutions. A more limited number of problems and solutions appear in the four data subcomponent sections (4.1.2 through 4.1.5) which are less detailed and primarily refer to the appropriate problems, solutions, and procedures found in Section 4.1.6. While each of the four data subcomponent sections contains a description of and a table summarizing Data Source Coverage, Section 4.1.6 on Supply/Demand Interface contains a Cross-Classification Resources section describing the various cross-classification documents. The following section discusses user needs in relation to classification issues.

EXHIBIT 4.1.1-1
MAJOR CLASSIFICATION SYSTEMS

Classification Subject Area	Major Classification Systems
Occupations	• Dictionary of Occupational Titles (DOT) • Standard Occupational Classification (SOC) Manual • Classified Index of Industries and Occupations--Census of Population • Occupational Employment Statistics (OES) Survey codes • OES Survey-based matrix codes • Census-based matrix codes • Military-Civilian Occupational Source Book
Industries	• Standard Industrial Classification (SIC) Manual • DOT Industry Designations • Classified Index of Industries and Occupations
Educational programs or disciplines	• U.S. Office of Education (USOE) Standard Terminology for Curriculum and Instruction in Local and State School Systems, Handbook VI, State Educational Records and Report Series • A Taxonomy of Instructional Programs in Higher Education for use in the Higher Education General Information Survey (HEGIS) • A Classification of Instructional Programs (CIP)--(scheduled for use on a voluntary basis for HEGIS and VEDS reporting in school year 1981-82)

USER NEEDS

Several different aspects of user needs relate to the classification issue. First, and perhaps most important, users require information presented by a classification system that is applicable to their decisionmaking process. In other words, the basis of presentation of the data in a supply/demand interface is a key issue to consider in determining the classification system specifications of a supply/demand product. For example, vocational education planners and administrators typically need information by USOE program for their planning purposes and for the subsequent preparation of a State Plan. By contrast, CETA planners usually need information by occupational training area (perhaps using DOT or SOC classifications for their planning process.

A second aspect of user needs relates to the difficulties in developing an occupational supply/demand interface because of the relationships between different classification systems. Almost all users who could benefit from a supply/demand interface would require the inclusion of data from multiple sources of information that use different classification systems. The classification system employed internally by a user will often determine the classification system wanted for display or presentation of occupational supply/demand information. However, demand data classified by another coding system and perhaps one or more additional sources of supply data (also using various classification systems) will need to be related to the classification system chosen for presentation to develop an effective unit of analysis for the supply/demand interface. Therefore, procedures need to be developed that will permit data from different information sources to be related to each other and then displayed by the desired classification system. Furthermore, different users may each want information displayed using a different classification system as the basis of presentation.

OVERVIEW OF THE MAJOR CLASSIFICATION SYSTEMS

A basic understanding of the classification system used in different information sources is essential to understanding the procedures necessary to deal with the classification issues in an OIS. Each of the different classification systems varies substantially with regard to conceptual structure, level of detail, number of titles included, and the number of levels of aggregation or disaggregation possible. Because of these variations, relating codes or titles between and among different classification systems can be very complex. Obviously, this problem is central to the preparation of an occupational supply/demand interface because of the variety of data sources that must be combined, which usually involves relating educational program classifications to occupational classification structures,

The classification systems used for the data sources in the OIS subcomponents are indicated in Exhibit 4.1.1-2 on the following page. Exhibit 4.1.1-2 can be used to summarize the classification coverage of available State data sources. These classification systems include (in the order in which they appear on the exhibit):

- OES Survey
- OES Survey-based Matrix
- 1970 Census
- Census-based Matrix
- DOT--3rd Edition
- DOT--4th Edition
- SOC
- 1972 SIC (as updated in 1978)
- 1967 SIC
- HEGIS
- USOE (Handbook VI)
- Military Occupations
- Other

Each of these classification systems will be briefly described in one of the following exhibits:

- Exhibit 4.1.1-3: Occupational Classification Systems
- Exhibit 4.1.1-4: Industrial Classification System
- Exhibit 4.1.1-5: Educational Program or Discipline Classification Systems

These exhibits immediately follow Exhibit 4.1.1-2. These exhibits indicate the following information for each of the classification systems:

- The Federal agency responsible for either:
    - The administration of programs that collect or tabulate data using the classification system
    - The maintenance, revision, and periodic publication of the classification system
- A brief description of the classification system
- The source publication that presents the classification system

STRUCTURE OF SECTION

Classification issues are described in this section as they apply to each OIS subcomponent. They are presented in the following subsections on the indicated pages:

Subsection Number	Subsection Title	Pages
4.1.2	Long-term Demand	4.1-11
4.1.3	Current and Short-term Demand	4.1-21
4.1.4	Entrants from Education/Training Program	4.1-25
4.1.5	Jobseekers	4.1-33
4.1.6	Supply/Demand Interface	4.1-36

The following topics are addressed within each subsection:

- Data Source Coverage (or Cross-Classification Resources in Subsection 4.1,6)
- Problem Background
- Problem(s)
- Solutions
- Procedural Steps for Problem Resolution

4.1.2 LONG-TERM DEMAND

DATA SOURCE COVERAGE

The classification systems used by the major sources of projected long-term demand data are indicated in Data Source Coverage Table 4,1,2. Projected long-term demand data for both industries and occupations are available from the Industry-Occupation (I-O) Matrix. The industrial demand data are classified by the Standard Industrial Classification (SIC) 1967 and 1972 editions. The classification system used for the occupational demand data projections vary depending on the source of the base occupational employment data. Occupational employment projections based on the OES survey are classified using OES Survey-based matrix codes while projections based on the 1970 Census are classified by Census-matrix codes.

PROBLEM BACKGROUND

Projected long-term demand data on occupations are provided according to one of two classification systems, both different from the systems used by most other data sources included in a supply/demand product. Some users have very specific needs to have demand information available by a certain classification system. For example, the State agency responsible for vocational education needs to have demand data by USOE program areas to fulfill one of the requirements of the State Plan that must be submitted to obtain Federal funds for vocational education under PL 94-482. Career Information Delivery Systems that present information on specific occupations also need demand data to match their internal occupational classification titles.

	Page Number
PROBLEM:	
1. Users of information may require presentation of long-term demand information in accordance with a classification structure different from that in which the demand information has been either collected or tabulated. Education/training program providers may need to relate demand data directly to the classification system used for reporting their programs (e.g., USOE, DOT, or SOC), while Career Information Delivery Systems may need demand data by the occupational titles included in such systems.	
SOLUTIONS:	
a. Relate occupational titles for which there are long-term occupational demand data to codes in other classification systems based on relationships reflected in the NOICC publication, Vocational Preparation and Occupations (VPO).	4.1-14
b. Relate education/training programs to occupations based on the VPO (as in Solution a) and input from vocational education and employment and training program planners and administrators who will be using the supply/demand information.	4.1-16
c. Relate education/training programs to occupations based on the VPO (as in Solution a) and relationships between programs and occupational placements as reflected by follow-up information collected over time.	4.1-18
d. Combine the three preceding solutions to develop relationships between education/training programs and occupations that reflect State and local conditions.	4.1-20

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Users of information may require presentation of long-term demand information in accordance with a classification structure different from that in which the demand information has been either collected or tabulated. Education/training program providers may need to relate demand data directly to the classification system used for reporting their programs (e.g., USOE, DOT, or SOC), while Career Information Delivery Systems may need demand data by the occupational titles included in such systems.

SOLUTION: a. Relate occupational titles for which there is long-term occupational demand data to codes in other classification systems based on relationships reflected in the NOICC publication, Vocational Preparation and Occupations (VPO).

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Determine the classification structure used for the sources of available projected long-term occupational demand data.	. Use State Data Source Analysis Summary described in Chapter 2.
2. Determine the classification structures to which the demand information needs to be related to satisfy different user needs.	. The most likely choices are: - USOE classification for vocational education planning - SOC classification or other occupational titles for career information delivery purposes - DOT or SOC classification system for CETA planners and administrators
3. Relate different classification systems based on relationships reflected in Vocational Preparation and Occupations (VPO).	. Refer to Section 4.1.6, Problem 2, Solution a for more detail. . The BLS cross-walk tape may also be a resource for establishing these relationships (See Section 4.1.6, Cross-classification Resources)

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
4. Where it is necessary to break out data by each individual code and where demand data for an occupation are related to more than one code in the desired classification system, apply data allocation procedures.	. Refer to Section 4.1.6, Problem 3, Solutions a through e for allocation procedures.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Users of information may require presentation of long-term demand information in accordance with a classification structure different from that in which the demand information has been either collected or tabulated. Education/training program providers may need to relate demand data directly to the classificationsystem used for reporting their programs (e.g., USOE, DOT, or SOC), while Career Information Delivery Systems may need demand data by the occupational titles included in such systems.

SOLUTION: b. Relate education/training programs to occupations based on the VPO (as in Solution a) and from vocational education and employment and training program planners and administrators who will be using the supply/demand information.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Determine the classification structure used for the sources of available projected long-term occupational demand data.	. Use State Data Source Analysis Summary described in Chapter 2.
2. Determine the classification structures to which the demand information needs to be related to satisfy different user needs.	. The most likely choices are: - USOE classification for vocational education planning - DOT or SOC classification for CETA planners and administrators
3. Relate different classification systems based on relationships reflected in the VPO	. Refer to Section 4.1.6, Problem 2, Solution a for more detail. . The BLS cross-walk tape may also be a resource for establishing those relationships (see Secton 4.1.6, Cross-Classification Resources).
4. Refine the relationships defined in Step 3 based on input from vocational education and employment and training program planners and administrators who will be using the supply/demand information.	. Refer to Section 4.1.6, Problem 2, Solution b for more detail.

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
5. Where it is necessary to break out data by each individual code and where demand data for an occupation are related to more than one code in the desired classification system apply data allocation procedures.	. Refer to Section 4.1.6, Problem 3, Solutions a through e for allocation procedures.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Users of information may require presentation of long-term demand information in accordance with a classification structure different from that in which the demand information has been either collected or tabulated. Education/training program providers may need to relate demand data directly to the classification system used for reporting their programs (e.g., USOE, DOT, or SOC), while Career Information Delivery Systems may need demand data by the occupational titles included in such systems.

SOLUTION: c. Relate education/training programs to occupations based on the VPO (as in Solution a) and relationships between programs and occupational placements as reflected by follow-up information collected over time.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Determine the classification structure used for the sources of available projected long-term occupational demand data.	. Use State Data Source Analysis Summary described in Chapter 2.
2. Determine the classification structures to which the demand information needs to be related to satisfy different user needs.	. The most likely choices are: - USOE classification for vocational education planning - DOT or SOC classification for CETA planners and administrators
3. Relate different classification systems based on relationships reflected in the VPO	. Refer to Section 4.1.6, Problem 2, Solution a for more detail . The BLS cross-walk tape may also be a resource for establishing those relationships (see Section 4.1.6, Cross-Classification Resources).
4. Refine the relationships defined in Step 3 based on relationships between programs and occupational placements as reflected by follow-up information collected over time.	. Refer to Section 4.1.6, Problem 2, Solution c for more detail. . To avoid matching education/training programs to occupations on the basis of short-term fluctuations in the local economy, it is probably advisable to use a series of several years of follow-up placement data to assure that such short-term economic fluctuations are averaged out as they are reflected in the placement data.

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
5. Where it is necessary to break out data by each individual code and where demand data for an occupation are related to more than one code in the desired classification system, apply data allocation procedures.	Refer to Section 4.1,6, Problem 3, Solution a through e for allocation procedures.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM 1. Users of information may require presentation of long-term demand information in accordance with a classification structure different from that in which the demand information has been either collected or tabulated. Education/training program providers may need to relate demand data directly to the classification system used for reporting their programs (e.g., USOE, DOT, or SOC), while Career Information Delivery Systems may need demand data by the occupational titles included in such systems.

SOLUTION: d. Combine the three preceding solutions to develop relationships between education/training programs and occupations that reflect State and local conditions.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Determine the classification structure used for the sources of available projected long-term occupational demand data.	. Use State Data Source Analysis Summary described in Chapter 2.
2. Determine the classification structures to which the demand information needs to be related to satisfy different user needs.	. The most likely choices are: - USOE classification for vocational education planning - DOT or SOC classification for CETA planners and administrators
3. Combine the three preceding solutions to develop relationships between education/training programs and occupations that reflect State and local conditions.	. Refer to Section 4.1.6, Problem 2, Solution d for more detail.
4. Where it is necessary to break out data by each individual code and where demand data for an occupation are related to more than one code in the desired classification system apply data allocation procedures	. Refer to Section 4.1.6, Problem 3, Solutions a through e for allocation procedures.

4.1.3 CURRENT AND SHORT-TERM DEMAND

DATA SOURCE COVERAGE

Data Source Coverage Table 4.1.3 indicates the classification system used for each source of data on current and short-term demand. These data sources cover the full range of both occupational and industrial classification systems, although not all of the sources listed are available in every State. One source that is common to most States and that does provide a measure of job vacancies is the data available from the Employment Service, which is coded using the DOT. It should be noted that the Employment Service data may be coded at varying levels of detail ranging from three to nine digits.

PROBLEM BACKGROUND

Current and short-term demand data sources that measure job vacancies may be analyzed separately from an overall supply/demand interface to be used as a proxy indicator. Therefore, if multiple sources of such data using different classification systems are to be examined outside of the supply/demand unit of analysis, a method needs to be devised to relate the information from these different sources.

	Page Number
PROBLEM:	
1. Sources of data on current and short-term occupational demand are collected and reported using different classification systems. How might data from multiple sources be related for the purpose of analyzing job vacancy information?	
SOLUTION:	
a. Use cross-classification resource documents to combine information from different sources of current and short-term occupational demand data.	4.1-24

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM 1. Sources of data on current and short-term occupational demand are collected and reported using different classification systems, How might data from multiple sources be related for the purpose of analyzing job vacancy information?

SOLUTION: a. Use cross-classification resource documents to combine information from different sources of current and short-term occupational demand data.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Determine what sources of current and short-term projected occupational demand exist that in some way measure job vacancies and are systematically available for use in an OIS.	. Use the State Data Source Analysis Summary described in Chapter 2.
2. Determine how the information from the various sources of current and short-term projected occupational demand is classified.	. Use the State Data Source Analysis Summary described in Chapter 2.
3. Use a cross-classification resource document such as the NOICC publication, Vocational Preparation and Occupations (VPO), to relate the different data sources to a single classification system.	. See Section 4.1.6 for a discussion of the various cross-classification resources, . The BLS Crosswalk tape may also be a resource for establishing these relationships.
4. Add the data from different sources that have been recoded to a single classification system	. Duplication of data counts is common among sources of data on current and short-term demand (see Measurement Issues, Section 4.4.3) and therefore duplicative sources should not be added. The source with more complete coverage should be used either alone or in conjunction with other sources with which it does not overlap in coverage.
5. Analyze the resulting data (see Procedural Steps for Problem Resolution under Time Period Coverage Issues, Section 4.3.3, Problem 1, Solutions a through c).	

4.1.4 ENTRANTS FROM EDUCATION/TRAINING PROGRAMS

DATA SOURCE COVERAGE

The classification systems by which data on entrants from education/training programs are reported are listed in Data Source Coverage Table 4.1.4. While there are two different systems that specifically classify educaion/training programs or disciplines, the data sources on entrants from such programs are not limited to those classification systems. In fact, these data sources cover the range of occupational and industrial classification systems, exclduing only the occupational classifications associated with the OES program. In addition, some unique classification systems are used, as indicated in the Other and Comments columns.

PROBLEM BACKGROUND

A wide range of classification systems is used for data on entrants from education/training programs and only relatively few of the major data sources use the same classification. For this reason, methods of relating data from these different sources are needed to compare these data and to include them in a supply/demand interface.

	Page Number
PROBLEM:	
1. Reporting systems on education/training programs use different classification structures for information collection. How can the data from these different structures be related for subsequent supply/demand analysis?	
SOLUTIONS:	
a. Use one of the techniques for developing appropriate units of analysis at the supply/demand interface level without first combining multiple sources of data on entrants from education/training programs.	4.1-31
b. Combine multiple sources of data on entrants from education/training programs using cross-classification resources and/or the input of vocational education and employment and training program planners as to which programs have common curriculum objectives. These codes or clusters of codes can subsequently be matched to demand data.	4.1-32

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Reporting systems on education/training programs use different classification structures for information collection. How can the data from these different structures be related for subsequent supply/demand analysis?

SOLUTION: a. Use one of the techniques for developing appropriate units of analysis at the supply/demand interface level without first combining multiple sources of data on entrants from education/training programs.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the sources of data on entrants from education/training programs.	. See Data Source Coverage Table 4.1.4.
2. Identify the classification system used by each source of available data from Step 1.	. Use the State Data Source Analysis Summary described in Chapter 2.
3. Develop an appropriate unit of analysis which combines the various sources of data on entrants from education/training programs with the occupations to which the programs are related.	. Refer to Section 4.1.6, Problem 2, Solutions a through d for more detail. . Where programs are coded by a unique State MIS classification system, these will need to be included in the development of the over-all unit of analysis.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Reporting systems on education/training programs use different classification structures for information collection, How can the data from these different structures be related for subsequent supply/demand analysis?

SOLUTION: b. Combine multiple sources of data on entrants from education/training programs using cross-classification resources and/or the input of vocational education and employment and training program planners as to which programs have common curriculum objectives. These codes or clusters of codes can subsequently be matched to demand data.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the sources of data on entrants from education/training programs.	. See Data Source Coverage Table 4.1.4.
2. Identify the classification system used by each source of available data from Step 1, including program data sources that use unique State MIS codes.	. Use the State Data Source Analysis Summary described in Chapter 2.
3. Combine the multiple sources of data on entrants from education/training programs that use different classification systems by means of cross-classification resource documents and/or by considering input from vocational education and employment and training program planners as to which programs have common curriculum objectives.	. See Section 4.1.6 for a discussion of the Cross-Classification Resources. . Duplication of counts is common among sources of data for entrants from education/training programs (see Measurement Issues, Section 4.4.4) and therefore duplicative sources should not be combined. The sources with more complete coverage should be used if overlaps in coverage can be substantially eliminated.
4. Match the program codes or clusters of codes developed in Step 3 to occupational codes for which demand data are available.	. Refer to Section 4.1.6, Problem 2, Solutions a through d for more detail.

4.1.5 JOBSEEKERS

DATA SOURCE COVERAGE

Data Source Coverage Table 4.1.5, which applies to sources of data on jobseekers, indicates that two of the four major sources of standardized information on jobseekers use a common classification system. These two sources are the Unemployment Insurance System and Employment Service data on job applicants. Both of these sources use the Fourth edition of the DOT although the level of detail of the DOT coding (two-, three-, six-, or nine-digit codes) may vary, requiring aggregation or disaggregation of data coded at different levels of detail. Data on military discharges are coded by a unique occupational classification system used by the Department of Defense.

PROBLEM BACKGROUND

If information from sources of data on jobseekers is to be included in a supply/demand product, ways of relating this data to other data elements included in the interface need to be applied.

	Page Number
PROBLEM:	
1. Sources of data on jobseekers use different classification structures for collectionof information. How can data from these different structures be related for subsequent supply/demand analysis?	
SOLUTIONS:	
a. Determine with which units of analysis information pertaining to jobseekers should be associated based on relationships between the classification systems used for sources of data about jobseekers and individual classifications in the units of analysis.	4.1-35

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Sources of data on jobseekers use different classification structures for collection of information. How can data from these different structures be related for subsequent supply/demand analysis?

SOLUTION: a. Determine with which units of analysis information pertaining to jobseekers should be associated based on relationships between the classification systems used for sources of data about jobseekers and the individual classifications in the units of analysis.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the sources of available data on jobseekers.	. See Data Source Coverage Table 4.1.5.
2. Identify the classification system used for each source of data on jobseekers	. Use the State Data Source Analysis Summary described in Chapter 2.
3. Determine to which unit of analysis each individual code in the classification systems used for sources of data on jobseekers is related.	. Refer to Section 4.1.6, Problem 2, Solutions a through d for more detail.
4. Use the jobseekers information in conjunction with the current and short-term demand information on job openings to develop proxy indicators of the supply/demand situation for the corresponding units of analysis.	4. Refer to Section 5.4.2 for more detail regarding how this proxy can be calculated and then used for supply/demand analysis.

4.1.6 SUPPLY/DEMAND INTERFACE

CROSS-CLASSIFICATION RESOURCES

One of the major problems associated with occupational supply/demand analysis is the difficulty in relating or analyzing information that has been collected using different classification structures. To overcome this difficulty, a method for relating individual classifications from the various systems must be established. Several cross-classification resources are available to facilitate the process. These resources are listed in the Cross-Classification Resource Coverage Table 4.1.6. The Cross-Classification resources indicated in this table reflect national relationships among various classification systems that may need to be refined for application in State and local areas. The most commonly used cross-classification resources include:

- Interim Edition, Vocational Preparation and Occupations (VPO) Volume 1, 1979, National Occupational Information Coordinating Committee.
- Vocational Preparation and Occupations (VPO) (1980 and 1981 Editions), National Occupational Information Coordinating Committee
- Bureau of Labor Statistics (BLS) Cross-walk Tape

Each of these cross-classification resources is briefly described below:

- Vocational Preparation and Occupations (VPO) (Interim Edition)--In 1979 NOICC issued an interim edition of the VPO, a document presenting the U.S. Office of Education vocational education program categories and their related occupational codes and titles from several occupational classification systems. The Interim VPO represents NOICC's first effort to provide an up-to-date and easily accessible "cross-walk" among classification systems for SOICCs, employment service staff, vocational education planners, and others concerned with relating education and employment information. The interim edition is based on the Third and Fourth Editions of the Dictionary of Occupational Titles (DOT), preliminary information provided by the Bureau of Labor Statistics, the 1977 edition of the Standard Occupational Classification, the 1970 Census occupational classification system, and the U.S. Office of Education classification of vocational education instructional programs in the areas indicated below:

01.0000 Agriculture/Agribusiness Education
04.0000 Distributive Education
07,0000 Health Occupations Education
09.0000 Home Economics Education
14,0000 Business and Office Occupations
16,0000 Technical Education
17,0000 Trade and Industrial Occupations Education

Classification system interrelation procedures included in this sectionof the OIS Handbook are based primarily on this edition of the VPO.

Vocational Preparation and Occupations (1980 and 1981 Editions)--A NOICC funded project is in progress to revise the Interim Edition of the VPO and to prepare and issue various cross-walk products. This project is necessary because the classification systems upon which the Interim VPO is based have changed or will be changed in the near future. These changes include:

- BLS has recently completed its review of the relationship between OES Survey occupation codes and DOT codes.
- A 1980 edition of the SOC has been prepared.
- The 1980 Census occupational classification has been finalized.
- The education program taxonomies (USOE and HEGIS) have been revised,
- Users have recommended format changes and supplements for the VPO.

The NOICC project is being conducted in two stages. The first stage will result in a 1980 Edition of the VPO that uses the current 1970 Census occupational classification and the current education program codes, but will include the revisions to the SOC and revised OES Survey/DOT relationships. The second stage of the project will prepare the 1981 Edition of the VPO. It will include the 1980 Census occupational classification and the new educational program taxonomy that is being issued by the National Center for Education Statistics this year.

Both the 1980 and 1981 editions will contain three volumes and an automated computer tape containing the corss-walk of all of the classification systems. The revisions will contain cross-walks that will allow users to develop cross-classification relationships not only from USOE programs to various occupational classification systems, but also from the occupational classification systems to the education programs. There will be cross-walk tables in both editions in which the USOE codes, titles, and descriptions of vocational-technical programs are displayed with the related codes and titles from the DOT Fourth Edition, and the related codes from the following:

- Revised Standard Occupational Classification (SOC)
- OES Survey
- OES Survey-based Matrix
- Census-based Matrix

Also included in these cross-walk tables are General Education Development (GED), Specific Vocational Preparation (SVP), physical demands, and working conditions data that were derived from the job analyses conducted in preparing the DOT.

. Bureau of Labor Statistics (BLS) Cross-walk Tape--BLS has developed a detailed tape which provides a revised cross-walk between the OES Survey codes and the Fourth Edition DOT. BLS uses the DOT as the foundation for developing OES Survey occupations. The SOC has been incorporated into this tape. The BLS cross-walk tape is an integral part of the NOICC project to revise the VPO. The BLS cross-walk tape, distributed to the BLS regional offices, contains OES survey occupations used in the most recent Survey cycle.

Many nonstandard, unique, and independent classification systems are used by local education agencies, States, and various Federal Agencies. Examples might include:

. Veterans Administration classification of Vocational Education and college courses.

. The Vocational Rehabilitation codes for special employment situations not classified in the DOT.

- State Education Management Information Systems may use unique education program codes that are suitable for an individual State.
- Many surveys, such as wage surveys, must necessarily develop occupational classifications that will provide statistically sound data within a given labor market.

There are no specific rules for relating nonstandard classification systems; however, a few guidelines may be useful:

- Some unique classification structures may have been developed locally without awareness of the features of the standard classification systems. The agency using a unique classification structure may be willing to use a standard classification structure if afforded assistance and guidance through the SOICC network.
- Some nonstandard coding was created in an attempt to classify specific cases at a level of detail not found in the standard classification structure. Since there may not be a requirement for that level of detail in an OIS, these may be summarized into the more general categories of the standard classification structure, assuming that they can be related to the general structures.
- In certain agencies, standard, but obsolete, classification structures are still in use. Generally conversions between the succeeding editions of the standard classification systems, such as the DOT, are available from the responsible Federal agency, such as the conversion from the Third to Fourth Edition DOT issued by the U.S. Department of Labor.[1]

None of the current major cross-classification systems have included cross-walks of the HEGIS taxonomy to the USOE program codes or to any of the occuaptional classification systems. There are two primary reasons for not including the HEGIS taxonomy in cross-classification systems including:

- With the exception of the HEGIS disciplines in the 5000 Series relating to two-year programs at community colleges, the HEGIS academic programs often do not relate directly to a specific occupation or career field. For example, English majors may enter a broad range of career fields.

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[1] For more information about this conversion document, refer to Conversion Table of Code and Title Changes, Third to Fourth Edition Dictionary of Occupational Titles, U.S. Department of Labor, Employment and Training Administration, 1979.

- Generally, the technical programs found at the community colleges that lead directly to a specific career area may also be reported to the Vocational Education Data System (VEDS) under the more detailed USOE Program Codes.

A number of cross-walks relate the USOE program codes to the HEGIS Taxonomy. These cross-walks, with the exception of the Texas publications, are oriented toward providing a conversion for the HEGIS Taxonomy 5000 series technical programs to occupations or USOE programs. These source publications are:

- Directory of Postsecondary Schools with Occupational Programs, 1978. National Center for Education Statistics, Appendix A, Program Abbreviations, pp. 317-320.

- Occupational Projections and Training Data, U.S. Department of Labor, Bureau of Labor Statistics, 1979, Bulletin 2020, Appendix B., Detailed Occupational Projections, pp. 80-93.

- Postsecondary Educational Supply and Occupational Demand in Texas. Supplement to the March 1978 Report, State 1202 Commission, January 1980, Coordinating Board: Texas College and University System, Cross Reference of Occupations and Related Programs, pp. 187-210.

- Technical Report--Postsecondary Educational Supply and Occupational Demand in Texas for the Period 1977-1983, Coordinating Board: Texas College and University System.

  Appendix J - Occupation to Program Match, Graduate Degree Programs

  Appendix K - Occupation to Program Match, Baccalaureate Degree Programs

  Appendix L - Occupation to Program Match, Vocational Programs and Associated Degrees

- Educational Occupational Cross-Code Index, The Massachusetts Postsecondary Education Commission, May 1978.

PROBLEM BACKGROUND

The quantitative occupational supply/demand analysis, in which certain occupational supply and demand information are interrelated, is a series of procedures designed to integrate available information at State and sub-State levels for defined time periods. Perhaps the most critical aspect of the occupational supply/demand analysis concerns the classification level at which the analysis should occur. To clarify this notion, one should review the classification systems used to categorize existing occupational supply and demand information. Exhibit 4.1.6-1 summarizes the classification systems used to codify data for each major source of information. (Refer to Data Source Coverage Tables 4.1.2, 4.1.3, 4.1.4 and 4.1.5 for more information about the classification systems used in various data sources).

Exhibit 4.1.6-1: Classification Systems Used For Major Occupational Demand And Supply Data Sources

Occupational Demand		Occupational Supply	
Data Source	Classification System	Data Source	Classification System
1. OES Program--Employment Estimates and Projections	. Census-based matrix classifications . OES Survey-based matrix classifications	1. VEDS	USOE
		2. HEGIS	HEGIS
		3. NCES Survey	USOE
		4. CETA MIS	DOT or SOC
2. Employment Service Job Orders	. DOT	5. SNAPS	DOT
		6. Vocational Rehabilitation MIS	DOT
3. Job Vacancies	. SOC, OES Survey, or DOT	7. State Education MIS	Varies by State
		8. WIN	DOT
		9. Job Corps	DOT
		10. UI	DOT
		11. ESARS	DOT
		12. Veterans	MOS

As can be seen from the exhibit, the principal sources of demand information are categorized using OES Survey-based or Census-based matrix classifications and the principal sources of supply information are categorized using the USOE, HEGIS, or DOT classifications. Because of the variety of classification systems used for occupational supply and demand information, selection of the appropriate classification level of supply/demand analysis is difficult, The problem is further compounded when some practical labor market considerations are taken into account, including:

- A vocational education or skills training program may prepare a person for entry into either a specific occupation or one of several related occupations.
- The method of preparation for employment in an occupation may be a specific education/training program, one of several related education/training programs, or a certain level of general education development.

These considerations present some difficulties in trying to interface supply and demand information and are reflected to a certain extent in the interrelationships between various classification systems as presented in cross-classification resource documents such as the VPO. In some cases, there is a one-to-one relationship between the codes in two different classification systems. For example, each DOT generally relates to only one OES Survey code, although more than one DOT may relate to the same OES Survey code, which requires only simple aggregations of codes to relate the two classification systems. By contrast, the relationship between USOE program codes and OES Survey-based matrix occupations is much more complex. Because specific USOE program codes tend to represent a fairly broad curriculum, education/training programs classified by USOE codes may provide individuals with skills that enable them to compete for entry in several occupations. Furthermore, there is overlap among the broad USOE program categories in that more than one USOE program may prepare entrants to a single matrix occupation. In summary, the major difficulty in matching supply information to demand information is that a single educational program cannot simply be matched with a specific occupation. Although this scenario could occur, more often than not, a program area will lead to a group of related occupations, which in turn will relate to additional programs.

Units of analysis need to be defined that can accommodate the classification systems used by the various data sources to be included in the supply/demand interface. This will permit available data to be directly incorporated into the supply/demand analysis once these units of analysis have been defined. Of necessity, these units of analysis must be constructed at the classification system level of detail for which information exits. Each unit of analysis will contain:

- A single program or group of programs that has a common occupational objective. (Note: The program(s) must be selected based on the programs being offered in the State.)
- The occupation or group of occupations that is related to the above program(s). (Note: The occupations must be selected from the available sources of occupational demand information.)

The unit of analysis may also be referred to as a cluster, since the unit groups or "clusters" related programs and occupations into a single analytical framework. A unit of analysis (or cluster) could contain any of the following combinations:

- One program and one occupation
- One program and several occupations
- Several programs and one occupation
- Several programs and several occupations

A unit of analysis may be based on:

- An educational program or group of programs and the occupation(s) related to those program(s) (supply-based unit of analysis).
- An occupation or group of occupations and the program(s) that prepare individuals for that occupation (demand-based unit of analysis).
- An interface unit of analysis which conceptually combines both supply components and demand components in an attempt to develop a model representing the labor market interface between supply and demand

These three types of units of analysis are not essentially different in the data components that they contain, but they differ in the way in which they are conceptualized.

Technically, the unit of analysis actually consists of individual codes from different classification systems. These codes are associated with actual supply or demand information, thus permitting the occupational supply/demand interface and analysis.

There are three major problems to consider in resolving the classification issues for the supply/demand interface in an OIS:

- Selecting a Basis of Presentation--This problem requires recognition of a user need for information in accordance with a specific classification system. The classification system by which information must be presented influences the process for developing a unit of analysis.
- Creating Units of Analysis--This problem requires procedures for developing units of analysis that contain the individual codes from the classification systems used by the available sources of occupational supply and demand data. Development of units of analysis must use the classification system needed as a basis of presentation as the frame of reference for selection of codes to be included in the cluster.
- Allocating Data Among the Units of Analysis--Procedures to allocate data among units of analysis may be necessary in cases where certain education/training programs or occupations are included in more than one unit of analysis. Allocation of the supply or the demand data is necessary to more accurately reflect the labor market for the education/training programs and occupations included in the unit of analysis.

The following three tables present the supply/demand interface classification problems and the range of solutions to these problems. Procedural steps for each solution are provided on the indicated pages.

	Page Number
PROBLEM--BASIS OF PRESENTATION	
1. Different users have a need for occupational supply/demand information presented in a specific manner based on the intended uses of the supply/demand analysis. How can the basis of presentation of the information to users be considered in developing the units of analysis (or clusters) that will be used for quantitative supply/demand analysis?	
SOLUTIONS:	
a. Users who are planners and administrators of education/training programs often need supply/demand information based on a specific classification system to facilitate program planning and/or to fulfill possible legislative requirements. Therefore, the units of analysis for the supply/demand interface should be based on the classficiation system that is needed for presentation of information to satisfy specified user requirements.	4.1-50
b. Employment outlook for career guidance purposes needs to be based on the occupational fields described in Career Information Delivery Systems (CIDS). Therefore, the employment outlook information should be developed for the occupational titles specifically included in a career guidance information system.	4.1-53

	Page Number
PROBLEM--UNITS OF ANALYSIS	
2. Occupational supply and demand information is not available in the same classification structures. Therefore, how can units of analysis based on logical relationships among education/training programs and occupations be developed for use in relating occupational supply and demand information?	
SOLUTIONS:	
a. Develop units of analysis of education/training programs and occupations based on relationships between classification systems as reflected in the NOICC publication, Vocational Preparation and Occupations (VPO).	4.1-55
b. Develop units of analysis based on the VPO (as in Solution a) and on input from vocational eduation and employment and training program planners and administrators who will be using the occupational supply/demand information associated with the units of analysis.	4.1-72
c. Develop units of analysis based on the VPO (as in Solution a) and relationships between educational programs and occupational fields of placement as reflected by follow-up information collected over time.	4.1-75
d. Combine the three preceding solutions to develop units of analysis that reflect the State and local conditions in terms of relationships between education/training programs and occupations.	4.1-79

	Page Number
PROBLEM--ALLOCATION	
3. Education/trainging programs or occupations for which there are supply and demand data may be included in more than one unit of analysis. What methods might be used to allocate either education/training program data or occupational demand data among the units of analysis to more accurately reflect local labor market conditions?	
SOLUTIONS:	
a. Allocate entrants from an education/training program or program cluster among the related occupations on the basis of annual net demand in each occupation relative to the total annual net demand for all related occupations.	4.1-81
b. Allocate entrants from an education/training program or program cluster among the related occupations on the basis of the relative share of placements from a program into each related occupation. Relative placement share can be derived from a time series of follow-up placement data sufficient to permit identification of typical placement patterns.	4.1-85
c. Use the inverse Industry-Occupation matrix (either OES Survey- or Census-based, depending on local data availability) to identify the distribution of occupational employment and demand by industry. This information can be used to allocate occupational demand to units of analysis containing education/training programs relating to industry-specific occupations.	4.1-87

(Continued on Next Page)

PROBLEM 3 (continued)

	Page Number
d. Allocate occupational demand information to education/training programs based on the size of each program or program cluster as measured either by completions or related placements relative to the total level of completions or related placements for all related programs or program clusters.	4.1-89

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Different users have a need for occupational supply/demand information presented in a specific manner based on the intended uses of the supply/demand analysis. How can the basis of presentation of the information to users be considered in developing the units of analysis (or clusters) that will be used for quantitative supply/demand analysis?

SOLUTION: a. Users who are planners and administrators of education/training programs often need supply/demand information based on a specific classification system to facilitate program planning and/or to fulfill possible legislative requirements. Therefore, the units of analysis for the supply/demand interface should be based on the classification system that is needed for presentation of information to satisfy specified user requirements.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. From an assessment of the needs of users who are education/training program planners and administrators, determine their specifications regarding the classification system to be used for presentation of the supply/demand data (e.g., USOE, DOT, SOC, HEGIS).	
2. For each user to be provided with a specific supply/demand product, identify those codes within the specified classification system for which data are available.	

(Continued on Next Page)

<table>
<tr><th>PROCEDURAL STEPS</th><th>COMMENTS/LIMITATIONS</th></tr>
<tr><td>3. Determine whether users require supply/demand information for each individual education/training program code for which data are available or whether they can use or might prefer data presented by clusters or groups of program codes.</td><td>. The following table summarizes different users and the alternative classification basis of presentation that they might prefer:
<table>
<tr><th>User Group</th><th>Classification Basis of Presentation</th></tr>
<tr><td>Vocational education planners and administrators</td><td>. Individual USOE programs
. Groups (or clusters) or USOE programs with common curricula</td></tr>
<tr><td>CETA planners and administrators</td><td>. Individual skills training program (DOT or SOC)
. Groups (or clusters) of skills training programs (DOT or SOC)</td></tr>
<tr><td>Higher education planners and administrators</td><td>. Individual academic discipline (HEGIS degree field)
. Groups (or clusters) of academic disciplines (HEGIS degree fields)</td></tr>
</table></td></tr>
<tr><td>4. Using the table in the comment to Step 3, select the classification system that a specific user requires as the basis of presentation and determine if other classification systems can be reflected in the supply/demand interface.</td><td></td></tr>
</table>

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PROCEDURAL STEPS	COMMENTS/LIMITATIONS
5. Use the classification system selected for the basis of presentation to provide a frame of reference for developing units of analysis. If groups (or clusters) of programs can be included in a single unit of analysis, then programs must be grouped according to designated criteria.	. Refer to Section 4.1.6, Problem 2, Solutions a through d for further detail.
6. Determine whether all users can understand and use a common set of units of analysis that reflect all necessary classification systems. . If users can use a common set of units of analysis, then special indexing might be helpful to assist users in locating specific codes within the different units of analysis. . If users are not able to use a common set of units of analysis, then a different set may have to be generated using the classification system desired as the basis of presentation for the frame of reference that is used to develop these "customized" units of analysis.	. This would require workshops and training for vocational educators, CETA prime sponsor personnel, and higher education administrators on the unit of analysis concept and how this facilitates the development and presentation of occupational supply/demand information.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1, Different users have a need for occupational supply/demand information presented in a specific manner based on the intended uses of the supply/demand analysis, How can the basis of presentation of information to users be considered in developing the units of analysis (or clusters) that will be used for quantitative supply/demand analysis?

SOLUTION: b. Employment outlook for career guidance purposes needs to be based on the occupational fields described in Career Information Delivery Systems (CIDS). Therefore, the employment outlook information should be developed for the occupational titles specifically included in a career guidance information system,

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Determine the relationship between the occupational titles in a CIDS and the occupational classifications for which demand information are available.	. The NOICC policy with respect to the occupational titles in a CIDS program is: "Use the Standard Occupational Classification(SOC) as the primary classification within which occupational titles and descriptions will be presented." . In many of the States that have a CIDS program, the primary classification being used is not currently the SOC although many States are developing plans to adapt or convert to the SOC.
2. Determine which of the occupational classifications for which demand information are available are related to more than one occupational title that is included in the CIDS. Also, determine which of the occupational classifications for which demand information is available are related directly to an occupational title that is included in the CIDS.	. This determination may be difficult in some instances because the occupational titles included in a CIDS program may not conform exactly to any one occupational classification system. Therefore, matching these occupational titles to occupational classifications for which demand information is available may be difficult because of the inability to use standard cross-classification resources.

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
3. For those demand occupational classifications related to multiple occupational titles in a CIDS, the demand information must be allocated to the occupational titles included in the CIDS. This allocation can probably best be accomplished based on the analysis and knowledge of occupational information specialists familiar with the production of the demand data and its classification system.	
4. Supply data from various sources should then be matched to the appropriate occupational titles from the CIDS to which demand data have already been assigned. Institutional supply from education/training programs should be assigned to occupations on the basis of the occupational objectives of the programs and the skills imparted through the program which would enable individuals to compete for entry into specific occupations. In this context, the analysis of occupational supply and demand information for the occupational titles within a CIDS program will result in a statement describing the employment outlook for each occupation.	. Employment outlook for a CIDS program is generally a statement about the employment opportunities in specific occupations. The employment outlook for occupations within a CIDS (based on a supply/demand interface) is only one portion of the overall information base needed for such a system. Other important elements are occupational characteristics data, requirements for entry, and information on the education/training programs which prepare for certain occupations, as well as information about the institutions which provide that preparation. . For further detail on relating education/training programs to occupations, refer to the unit of analysis development process, Section 4.1.6, Problem 2, Solutions a through d.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 2. Occupational supply and demand information is not available in the same classification structures. Therefore, how can units of analysis based on logical relationships among education/training programs and occupations be develoepd for use in relating occupational supply and demand information?

SOLUTION: a. Develop units of analysis of education/training programs and occupations based on relationships between classification systems as reflected in the NOICC publication, Vocational Preparation and Occupations (VPO).

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Determine which classification systems are used by the available sources of occupational demand and occupational supply information in the State.	• The classification systems used in available sources of information must be reflected in the units of analysis developed to permit interfacing of demand and supply information. • Refer to the State Data Source Analysis Summary in Chapter 2.
2. Determine which classification system will serve as the frame of reference for the development of the units of analysis.	• The considerations for selecting which classification system should serve as the frame of reference primarily depends on the needs of the user group(s) being served. Refer to the discussion of basis of presentation in Section 4.1.6, Problem 1, Solution a for more detail.
3. Locate the proper set of tables in the VPO for the development of units of analysis relating other data sources to the classification system selected as a frame of reference. Guides for selecting the appropriate tables to use in the VPO are presented in Exhibit 4.1.6-2.	• The BLS cross-walk tape may also be a resource for establishing relationships between classification systems. (See Section 4.1.6 Cross-Classification Resources.)
4. For the classification system selected as the frame of reference determine either:	

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
. Which education programs (USOE and/or HEGIS) have common occupational objectives based on common curricula	
. Which employment and training programs (DOT or SOC) have common occupational objectives in terms of job placement	
These determinations should result in the selection of either a single program or occupation or a group of programs or occupations to serve as the basis of a unit of analysis.	. Refer to Exhibits 4.1.6-5, 4.1.6-6, 4.1.6-7, and 4.1.6-8 for examples of how groups of educational programs with common occupational objectives can be grouped or clustered.
5. For each program or occupation selected in Step 4 for inclusion in the unit of analysis, the appropriate tables in the VPO must be used to determine the codes from other classification systems that are related to the program or occupation. For example:	
. For USOE program-based units of analysis--	
- Depending on the classification system of the available information, determine the list of OES Survey-based or Census-based matrix occupations that might be related to the USOE programs in the unit of analysis.	. This can be accomplished by using the appropriate tables and appendices in the VPO.
- Eliminate the "marginally related" occupations based on an analysis of the DOT occupations that caused the OES Survey-based or Census-based matrix occupations to be related to the USOE programs in the unit of analysis.	. For a further discussion of "marginally related" occupations, refer to Exhibit 4.1.6-9, which includes appropriate sections of a report in which this concept was addressed.

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PROCEDURAL STEPS	COMMENTS/LIMITATIONS
- Include SOC or DOT classifications in the units of analysis if CETA is offering training programs that are similar in either curriculum on job placement intent to the USOE programs in this unit of analysis.	. This can be accomplished by using the appropriate tables and appendices in the VPO.
. For DOT or SOC training program-based units of analysis--	
- Depending on the classification system of the available demand information, determine the list of OES Survey-based or Census-based matrix occupations that might be related to the DOT or SOC training programs in the unit of analysis.	. This can be accomplished by using the appropriate tables and appendices in the VPO.
- Eliminate the "marginally related" occupations based on an analysis of the DOT occupations that caused the OES Survey-based or Census-based matrix occupations to be related to the SOC programs in the unit of analysis.	. For a further discussion of "marginally related" occupations, refer to Exhibit 4.1.6-9, which includes appropriate sections of a report in which the concept was addressed.
- Include USOE classifications in the units of analysis if vocational education is offering programs that are similar in either curriculum or job placement intent to the training programs in this unit of analysis.	. This can be accomplished by using the appropriate tables and appendices in the VPO.
. For occupational demand-based units of analysis--	
- Determine the vocational education or employment and training programs that prepare individuals for entry	. This can be accomplished by using the appropriate tables and appendices in the VPO.

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
into the occupations in the unit of analysis. This determination may be based on: .. Common curriculum of programs .. Common placement objectives of programs .. Similar placement history of program completers	
6. Prepare unit of analysis summary sheets that indicate the individual classifications that are included in each unit of analysis	. Occupations and/or education/training programs may be included in more than one unit of analysis, thus necessitating the application of allocation procedures (see Section 4.1.6, Problem 3, Solutions a through d for more detail). . HEGIS programs can also be included in units of analysis although there are no standard definitions of HEGIS degree programs and none of the standard cross-classification resources contain HEGIS classifications.
7. The end result of the unit of analysis development process will be a group or cluster of related codes and titles from different classification systems. Available quantitative occupational supply and demand information can be associated with the individual codes in the units of analysis.	. See Exhibits 4.1.6-3 and 4.1.6-4 for summaries of the code systems that must be related to the reference classification system to assure that a cluster contains the necessary classifications to function as the unit of analysis for interfacing supply and demand information. . Exhibits 4.1.6-5 through Exhibit 4.1.6-8 provide examples of the unit of analysis concept for different vocational education/employment and training program areas.

EXHIBIT 4.1.6-2
DECISION RULES FOR SELECTING
THE APPROPRIATE TABLES
AND APPENDICES FROM THE VPO
FOR UNIT OF ANALYSIS DEVELOPMENT

Page 1 of 2

Classification System Frame Of Reference For Unit Of Analysis Development	Appropriate Tables From The VPO (Interim Edition)	Appropriate Appendices From The VPO (Interim Edition)
1. USOE	. Cross-walk Tables, Volume 1 - 01 Agriculture/Agribusiness Education - 04 Distributive Education - 07 Health Occupations Education - 09 Home Economics Education - 14 Business and Office Occupations Education - 16 Technical Education - 17 Trade and Industrial Occupations Education	. Appendix F or G, Volume 1 - Appendix F for OES Census-Based I-O Matrix Information - Appendix G for OES Survey-Based I-O Matrix Information
	. USOE Classification Tables, Volume 2	
2. OES	. OES Classification Tables, Volume 2 . Cross-walk Tables, Volume 1	Appendix G, Volume 1
3. SOC	. SOC Classification Table, Volume 2 . Cross-walk Tables, Volume 1	Appendix F or G, Volume 1
4. Census	. Census Occupational Classification Table, Volume 2 . Cross-walk Tables, Volume 1	Appendix F, Volume 1

EXHIBIT 4.1.6-2

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Classification System Frame Of Reference For Unit Of Analysis Development	Appropriate Tables From The VPO (Interim Edition)	Appropriate Appendices From The VPO (Interim Edition)
5. DOT	. DOT Classification Table, Volume 2 . Cross-walk Tables, Volume 1	Appendix F or G, Volume 1
6. HEGIS	. No appropriate tables--must use one of the following sources: - Occupational Projections and Training Data, (U.S. Department of Labor Statistics, 1979, Bulletin 2020) .. Appendix B, Detailed Occupational Projections .. Appendix C, Detailed Training Statistics	Appendix F or G, Volume 1

EXHIBIT 4.1.6-3
BASIS OF UNITS OF ANALYSIS AND REFERENCES FOR RELATING SUPPLY CLASSIFICATION SYSTEMS FOR UNIT OF ANALYSIS DEVELOPMENT

BASIS OF UNIT OF ANALYSIS		CLASSIFICATION SYSTEMS USED BY AVAILABLE SOURCES OF SUPPLY INFORMATION	
CLASSIFICATION SYSTEM FRAME OF REFERENCE	RESOURCES AVAILABLE FOR USE IN DEFINING THE UNIT OF ANALYSIS	CLASSIFICATION SYSTEM	REFERENCES FOR RELATING TO FRAME OF REFERENCE CLASSIFICATION
1. Supply-based unit of analysis--USOE Programs	Units of analysis should be defined by common occupational objectives of programs based on common curricula Resources Available-- . Cross-walk Tables, Volume 1 of the VPO	1. USOE	. Basis of unit of analysis
		2. SOC	. Cross-walk Tables and Appendix E, Volume 1 of the VPO
		3. DOT	. Cross-walk Tables, Volume 1 of the VPO
2. Supply-based unit of analysis--SOC Employment and Training Programs	Units of analysis should be defined by common occupational objectives of programs in terms of job placement Resources Available-- . Cross-reference Tables, Volume 2 of the VPO . SOC Manual	1. USOE	. Cross-reference Tables, Volume 2 of the VPO
		2. SOC	. Basis of unit of analysis
		3. DOT	. SOC Manual . SOC Index
3. Supply-based unit of analysis--DOT Employment and Training Programs	Units of analysis should be defined by common occupational objectives of programs in terms of job placement Resources Available-- . Cross-walk Tables, Volume 1 of the VPO . SOC Manual . DOT	1. USOE	. Cross-reference Tables, Volume 2 of the VPO
		2. SOC	. SOC Index
		3. DOT	. Basis of unit of analysis
4. Demand-based unit of analysis--OES or Census-based	Units of analysis should be defined by common characteristics in terms of requirements for entry Resources Available-- . OES Dictionary of Occupations . Classified Index of Industries and Occupations	1. USOE	. Cross-reference Tables, Volume 2 of the VPO
		2. SOC	. Cross-reference Tables, Volume 2 of the VPO
		3. DOT	. BLS Cross-walks
5. Demand-based unit of analysis--SOC-based	Units of analysis should be defined by common characteristics in terms of requirements for entry Resources Available-- . Cross-reference Tables, Volume 2 of the VPO . SOC Manual	1. USOE	. Cross-reference Tables, Volume 2 of the VPO
		2. SOC	. Basis of unit of analysis
		3. DOT	. SOC Manual . SOC Index

BASIS OF UNITS OF ANALYSIS AND REFERENCES FOR RELATING DEMAND CLASSIFICATION SYSTEMS FOR UNIT OF ANALYSIS DEVELOPMENT

BASIS OF UNIT OF ANALYSIS		CLASSIFICATION SYSTEMS USED BY AVAILABLE SOURCES OF DEMAND INFORMATION	
CLASSIFICATION SYSTEM FRAME OF REFERENCE	RESOURCES AVAILABLE FOR USE IN DEFINING THE UNIT OF ANALYSIS	CLASSIFICATION SYSTEM	REFERENCES FOR RELATING TO FRAME OF REFERENCE CLASSIFICATION
1. Supply-based unit of analysis--USOE Programs	Units of analysis should be defined by common occupational objectives of programs based on common curricula Resources Available-- . Cross-walk Tables, Volume 1 of the VPO	1. Census-based I-O Matrix	. Cross-walk Tables and Appendix F, Volume 1 of the VPO
		2. OES Survey-based I-O Matrix	. Cross-walk Tables and Appendix G, Volume 1 of the VPO
		3. DOT	. Cross-walk Tables, Volume 1 of the VPO
2. Supply-based unit of analysis--SOC Employment and Training Programs	Units of analysis should be defined by common occupational objectives of programs in terms of job placement Resources Available-- . Cross-reference Tables. Volume 2 of the VPO . SOC Manual	1. Census-based I-O Matrix	. Cross-reference Tables, Volume 2 of the VPO . Appendix F, Volume 1 of the VPO
		2. OES Survey-based I-O Matrix	. Cross-reference Tables, Volume 2 of the VPO . Appendix G, Volume 1 of the VPO
		3. DOT	. SOC Manual . SOC Index
3. Supply-based unit of analysis--DOT Employment and Training Programs	Units of analysis should be defined by common occupational objectives of programs in terms of job placement Resources Available-- . Cross-walk Tables, Volume 1 of the VPO . SOC Manual . DOT	1. Census-based I-O Matrix	. BLS Cross-walks . Supplement 3, *Tomorrow's Manpower Needs*
		2. OES Survey-based I-O Matrix	. BLS Cross-walks
		3. DOT	. Basis of unit of analysis
4. Demand-based unit of analysis--OES or Census-based	Units of analysis should be defined by common characteristics in terms of requirements for entry Resources Available-- . OES Dictionary . Classified Index of Industries and Occupations	1. Census-based I-O Matrix	. Basis of unit of analysis for Census data
		2. OES Survey-based I-O Matrix	. Basis of unit of analysis for OES Survey data
		3. DOT	. BLS cross-walks
5. Demand-based unit of analysis--SOC-based	Units of analysis should be defined by common characteristics in terms of requirements for entry Resources Available-- . Cross-reference Tables, Volume 2 of the VPO . SOC Manual	1. Census-based I-O Matrix	. Cross-reference Tables, Volume 2 of the VPO . Appendix F, Volume 1 of the VPO
		2. OES Survey-based I-O Matrix	. Cross-reference Tables, Volume 2 of the VPO . Appendix G, Volume 1 of the VPO
		3. DOT	. SOC Manual . SOC Index

EXAMPLES OF THE UNIT OF ANALYSIS (CLUSTER) CONCEPT

(INTRODUCTION TO EXHIBITS 4.1.6-5 to 4.1.6-8)

A series of exhibits beginning with Exhibit 4.1.6-5 and continuing through Exhibit 4.1.6-8 illustrate the unit of analysis concept. These exhibits progressively indicate the complexity of the unit of analysis concept as it can be used for the interface of occupational supply and demand information. Each of these exhibits will be described briefly in the sequence in which they appear.

- Exhibit 4.1.6-5--Dental Hygienists--This unit of analysis is a straightforward one that contains one educational program area and one occupational field. The program is related to only that occupation, and the occupation requires that specific program for entry into the field. The occupational supply/demand analysis for this unit of analysis would interface the information on entrants from that educational program with the demand information for that occupation.

- Exhibit 4.1.6-6--Food Services--This unit of analysis contains four vocational education programs that have common occupational objectives. The occupations included in this unit of analysis are occupations that vocational students from any of the four programs could potentially enter. If OES Survey-based matrix occupations are being used for the demand information, then this unit of analysis may be too large in terms of the number of occupational categories included. This situation could be corrected by developing a new unit of analysis that separates the USOE program Cooks/Chefs (17.2902) from the existing Food Services cluster.

- Exhibit 4.1.6-7--Electrical and Electronic Technology--This unit of analysis contains three closely related Technical Education programs that have common occupational objectives. Some of the occupations included in this unit of analysis are also included in the following Electricity and Electronics unit of analysis. Conceivably, the two units of analysis might be combined, but this would produce an inordinately large cluster that might not be an appropriate unit of analysis. Accordingly, the units of analysis were separated based on the apparent common occupational objectives of the vocational programs. Allocation procedures will need to be applied, since certain occupations are related to vocational programs in both units of analysis.

- Exhibit 4.1,6-8--Electricity and Electronics--This unit of analysis contains five vocational programs in Trade and Industrial Occupations Education, Some or all of these programs could have possibly been included in the preceding unit of analysis. If some of the programs were included in two units of analysis, then the supply information would have to be allocated between the units of analysis. As the unit of analysis exists, however, some of the occupations related to the programs are included in both this unit of analysis and the preceding one, hence, allocationprocedures for demand information will need to be applied.

The last two examples of units of analysis illustrate the potential complexities of defining the individual programs and occupations that should be included in a supply/demand unit of analysis. The individual elements of a unit of analysis are, in reality, specific titles and codes from instructional disciplines or occupational classification systems. These codes can be related through available cross-classification resources. These cross-classification resources were discussed in the introduction to Section 4.1.6.

The detailed procedures for developing units of analysis to be used in the supply/demand analysis vary according to who the principal users of the information might be. For vocational education, the units of analysis would be developed based on USOE programs. For CETA or career information, the units of analysis might be based on the occupations for which demand information is available or on the SOC or DOT. Regardless of what classification system is used as the basis for developing units of analysis, certain guidelines are necessary to assure that the units are developed on a consistent basis. These guidelines include:

1. Units of analysis must be based on a single classification system as a primary basis of the unit of analysis. Any classification system can serve as the basis for developing a unit of analysis.

2. Units of analysis should be homogeneous in terms of vocational programs and occupations included. The vocational programs included in a unit of analysis should have similar occupational objectives. The occupational categories included in a unit of analysis should be areas that individuals from the vocational programs in the unit of analysis would be likely to enter. The occupations should be similar in that they may have common characteristics or common skill requirements for entry.

3. The occupations included in a unit of analysis should reflect the occupational fields that can be entered directly as a result of the vocational education or employment and training programs included in the unit of analysis. Occupations that are only "marginally related" occupations, as discussed in depth in Exhibit 4.1.6-9, should not be included in the unit of analysis.

4. Units of analysis should reflect the realities of the labor market in terms of the occupations that leavers or completers of vocational education and employment and training programs actually enter. The purpose of the units of analysis is to facilitate the process of interrelating supply and demand information from different reporting systems and data sources that use different classification structures.

The quantitative supply/demand analysis will be structured procedurally around the units of analysis.

EXHIBIT 4.1.6-5
EXAMPLE OF THE UNIT OF ANALYSIS CONCEPT

Unit of Analysis--Dental Hygienists

Supply Elements of the Unit of Analysis

USOE Program(s)

Dental hygiene (Associate Degree) (07.0102)

HEGIS Program(s)

Dental Hygiene technologies (5203)

DOT Training Program(s)

Dental Hygienist (078.361-010)

Demand Elements of the Unit of Analysis

Census-Based Matrix Occupation(s)

Dental hygienists (10120100)

Or

OES Survey-Based Matrix Occupation(s)

Dental hygienists (10120402)

EXHIBIT 4.1.6-6
EXAMPLE OF THE UNIT OF ANALYSIS CONCEPT

Unit of Analysis--Food Services

Supply Elements of the Unit of Analysis

USOE Program(s)

Food services (04.0700)
Food management, production and services (09.0203)
Quantity foods occupations (17.2900)
Cook/chef (17.2902)

HEGIS Program(s)

Hotel and restaurant management technologies (5010)
Food services technologies (5404)

DOT Training Program(s)

Manager, food concession (185.167-022)
Manager, restaurant and coffee shop (185.167-002)
Caterer or manager, cafeteria or lunchroom (187.167-106)
Food service supervisor (319.137-010)
Manager, industrial cafeteria (319.137-018)
Chef (313.361-014)
Cook (313.361-014)
Food assembler (319.484-010)

Demand Elements of the Unit of Analysis

Census-Based Matrix Occupation(s)

Restaurant, cafe, and bar managers (20060350)
Sales and Sales Workers, nec (30000450)
Cooks, excluding private households (70040150)
Waiters (70040300)
Food workers, nec, excluding private households (70040350)

Or

OES Survey-Based Matrix Occupation(s)

All other managers (20061699) which includes these OES survey occupations:

1. Directors, food and beverage or managers, catering
2. Managers, restaurants, coffee shops or liquor establishments
3. All other managers

Waiters' assistants (70040600)
Waiters or waitresses (70041602)
All other food service workers (70041899)
Cooks, short-order, special fast food (70040802)
Cooks, restaurant (70040803)
Food preparation and service workers, fast food restaurant (70041804)
Pantry, sandwich and/or coffee makers (70041805)
Cooks, institutional (70040804)
Supervisors, nonworking, service (70200001)
All other sales workers (30001899)

EXHIBIT 4.1.6-7
EXAMPLE OF THE UNIT OF ANALYSIS CONCEPT

Unit of Analysis--Electrical and Electronic Technology

Supply Elements of the Unit of Analysis

USOE Program(s)

Electrical technology (16.0107)
Electronic technology (16.0108)
Electromechanical technology (16.0109)

HEGIS Program(s)

Electronics and machine technologies (5310)
Electromechancial technologies (5311)

DOT Training Program(s)

Electrical technician (003.161-010)
Electronics technician (003.161-014)
Electronic-sales-and-service technician (828.251-010)
Mechanical-apparatus model maker (712.261-010)

Demand Elements of the Unit of Analysis

OES Census-Based Matrix Occupation(s)

Electrical, electronic technicians (10080200)
Engineering, science technicans, nec (10080450)
Radio operators (10140250)
Pattern and model makers (50060550)
Other mechanics and apprentices (50080750)
Power station operators (50120200)

Or

OES Survey-Based Matrix Occupation(s)

Electrical and electronic technicians (10080803)
Broadcast technicians (10080808)
All other technicians (10141404)
All other mechanics and repairers (50083299)
Dispatchers, load (50120804)

EXHIBIT 4.1.6-8

EXAMPLE OF THE UNIT OF ANALYSIS CONCEPT

Unit of Analysis--Electricity and Electronics

Supply Elements of the Unit of Analysis

USOE Program(s)

Electricity (17.1002)
Electrical Occupations (17.1400)
Industrial Electrician (17.1401)
Electronics Occupations (17.1500)
Industrial Electronics (17.1502)

HEGIS Program(s)

Electronics and machine technologies (5310)
Construction and building technologies (5317)

DOT Training Program(s)

Electrician (824.261-010) (825.381-030)
Electrical Repairer (829.281-014)
Electric Meter Repairer (729.281-014)
Electric Tool Repairer (729.281-014)
Electronics Inspector 1 (726.381-010)
Electronics Assembler (726.684-018)
Electrical Inspector (710 281-014)

Demand Elements of the Unit of Analysis

OES Census-Based Matrix Occupation(s)

Electrical and Electronic Technicians (10080200)
Electricians and Apprentices (50020350)
Inspectors, Other (50140550)
Household Appliance Mechanics (50080500)
Radio, Television Repairers (50080650)
Other Mechanics and Apprentices (50080750)
Assemblers (61080100)
Checkers, Examiners, Etc., Mfg (61060050)

Or

OES Survey-Based Matrix Occupation(s)

Electric tool repairers (50083205)
Electric meter installers (50082002)
TV servicers and repairers (50082602)
All other mechanics and repairers (50083299)
Electricians (50021400)
Inspectors (50142202)
Instrument repairers (50083221)
Assemblers, (61080402)
Testers (50142205)
Helpers, Trades (80002823)

EXHIBIT 4.1,6-9
DISCUSSION OF MARGINALLY
RELATED OCCUPATIONS[1]
Page 1 of 2

MARGINALLY RELATED OCCUPATIONS[1]

An issue that arises in the match between vocational programs and Census or OES Survey occupations is the occurrence of occupations that appear to be only marginally related to the scope of vocational education. Occupations that are typically marginally related to vocational education occur particularly in the unskilled categories and in many professional occupations. Occupations in these areas generally require either no formal vocational training prior to employment or require training that is outside the realm of vocational education. Farm laborers and teachers are two examples of occupations that are marginally related to vocational education programs. The professional occupations of veterinarians, industrial engineers, and economists are examples of occupations matched to USOE programs by the cross-reference tables included in Vocational Preparation and Occupations. The difficulty in including these types of occupations in supply/demand comparisons is that they will tend to overstate the demand for graduates of a specific program by inflating the number of annual job openings related to that program. This can be misleading as it overstates the number of job openings for which program graduates are truly prepared.

The existence of marginally related occupations generally occurs in part as a result of the process used to relate vocational programs to Census or OES Survey occupations. This process is outlined in the discussion of the cross-reference tables in Vocational Preparation and Occupations, as they apply to the creation of units of analysis. Specifically, the problem of marginally related occupations occurs because vocational programs are matched first to DOT occupations and subsequently to Census or OES Survey occupations as there is no direct match between USOE programs and Census or Survey occupations. For example, Census occupation 180--Athletes and Kindred Workers consists of 32 DOT occupations, of which only one is actually related to a USOE vocational program, Animal Science - 01.0101. The remaining 31 DOT titles falling with Census Code 180 are not related to any vocational (USOE) program. According to the cross-reference table, however, the Census occupation Athletes and Kindred Workers would be related to vocational education and job openings for the entire Census occupation would be considered related to the training provided in USOE program 01.0101. Inclusion of such occupations has a tendency to overstate the number of job openings related to this program for two reasons. First, it is doubtful that the single DOT occupation, Racehorse Trainer, constitutes a significant enough portion of employment in this Census occupation to justify including all of the projected job openings for Athletes and Kindred Workers in the match to the USOE program Animal Science. Secondly, it is questionable what proportion of those employed as Racehorse Trainers or as Athletes and Kindred Workers has ever received vocational training to prepare them for their employment.

Merely examining what proportion of DOT titles within a Census or OES Survey code are matched to a USOE program, however, is not a very reliable method for determining whether that Census occupation is marginally related or not. These proportions can vary widely from one out of 31 cited in the example to a larger number of DOT titles related to vocational programs in a Census or OES survey occupation. There is no way to determine a meaningful cutoff point for what is and what is not marginally related. Since these proportions are only for the DOT titles and not employment, there is also no statistical basis for determining their relative importance wihtin a Census of OES Survey occupation. A more objective criteria that is conceptually related to the measure of appropriate training levels is needed.

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[1] Efforts to Match Information on the Demand and Supply of Labor in Massachusetts, by Christine LeCam and Pamela Frugoli (Massachusetts State Occupational Information Coordinating Committee, August 1980).

One measure which approximates the concept of appropriate training levels is the Specific Vocational Preparation (SVP) rating. The SVP has nine levels that represent duration of training required by a job. The nine levels are as follows:

Level	Time
1	Short demonstration only
2	Anything beyond short demonstration up to and including 30 days
3	Over 30 days up to and including 3 months
4	Over 3 months up to and including 6 months
5	Over 6 months up to and including 1 year
6	Over 1 year up to and including 2 years
7	Over 2 years up to and including 4 years
8	Over 4 years up to and including 10 years
9	Over 10 years

Occupations that have an SVP level of between three and six appear to be within the scope of vocational education, whereas SVPs less than three or greater than or equal to seven may qualify as marginally related. While this measure appears to be very valuable as a determinant of the marginal relatedness of an occupation there are a number of drawbacks. First, the SVP ratings were developed for DOT occupations rather than for Census or OES Survey occupations. A Census or OES Survey occupation is comprised of multiple DOT codes having a variety of SVP ratings. Obtaining an average SVP for a Census or OES Survey occupation can be a lengthy task for some of the broad Census or OES Survey categories and it also ignores the relative importance as measured by employment accounted for by a specific DOT occupation. Thus a simple average of the SVP assigned to the DOT titles within a Census or OES Survey occupation ignores any weighting of the various SVP values. Ideally, information about the proportion of total Census or OES Survey occupational employment accounted for by each DOT within that Census or OES Survey occupation would provide a method by which to weight the relative signficance of each DOT.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 2. Occupational supply and demand information is not available in the same classification structures, Therefore, how can units of analysis based on logical relationships among education/training programs and occupations be developed for use in relating occupational supply and demand information?

SOLUTION: b. Develop units of analysis based on the VPO (as in Solution a) and input from vocational education and employment and training program planners and administrators who will be using the occupational supply/demand information associated with the clusters.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Determine which classification systems are used by the available sources of occupational demand and occupational supply information in the State.	. The classification systems of the available sources of information must be reflected in the units of analysis developed to permit interfacing of demand and supply information. . Refer to the State Data Source Analysis Summary in Chapter 2.
2. Determine which classification system will serve as the frame of reference for the development of the units of analysis.	. The considerations for selecting which classification system should serve as the frame of reference primarily depends on the needs of the user group(s) being served. Refer to the discussion of basis of presentation in Section 4.1.6, Problem 1, Solution a for more detail.
3. Relate different classification systems based on relationships reflected in the VPO.	. Refer to Section 4.1.6, Problem 2, Solution a for more detail. . The BLS cross-walk tape may also be a resource for establishing those relationships (see Section 4.1.6, Cross-Classification Resources.)

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
4. Establish work groups or task forces of planners and/or administrators who will refine the relationships defined in Step 3.	. Training materials will be necessary to educate work group/task force participants with respect to the various classification systems, the unit of analysis concept, and the available sources of occupational supply and demand information.
5. Have the work groups refine the relationships between classification systems by initially verifying the education/training programs that should be grouped together for a logical unit of analysis. More specifically: . For vocational education--Have the work groups define each group of vocational education programs that have common occupational objectives in terms of curriculum. In some instances, a single program may have an occupational objective that is unique and thus cannot be related to other programs. This grouping process establishes the basis of the unit of analysis within the USOE classification system. . For employment and training programs--Have the work groups define each group of employment and training programs that have common occupational placement objectives. In some instances, an employment and training program may have an occupational placement objective that is unique and thus cannot be related to other programs. This grouping process establishes the basis of the unit of analysis within either the SOC or DOT classification system.	

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
6. Based on the grouping or clustering of vocational education programs or employment and training programs, the work groups must then review the occupations (from the classification system for which there is demand information) that are related to each cluster of programs based on the relationships shown in the VI[illegible]	. The classification systems for which there will be demand information will be either: - Census-based I-O matrix occupations - OES Survey-based I-O matrix occupations
7. After the relationships between programs and occupations are determined, group the selected vocational education or employment and training programs and related occupations to obtain the units of analysis necessary to interface available occupational supply and demand information.	. Refer to Steps 6 and 7 of Solution a to this problem for further detail about summarizing the units of analysis

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 2. Occupational supply and demand information is not available in the same classification structures. Therefore, how can units of analysis based on logical relationships among education/training programs and occupations be developed for use in relating occupational supply and demand information?

SOLUTION: c. Develop units of analysis based on the VPO (as in Solution a) and relationships between educational programs and occupational fields of placement as reflected by follow-up information collected over time.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Determine which classification systems are used by the available sources of occupational demand and occupational supply information in the State.	. The classification systems of the available sources of information must be reflected in the units of analysis developed to permit interfacing of demand and supply information. . Refer to the State Data Source Analysis Summary in Chapter 2.
2. Determine which classification system will serve as the frame of reference for the development of the units of analysis.	. The considerations for selecting which classification system should serve as the frame of reference primarily depends on the needs of the user group(s) being serviced. Refer to the discussion of basis of presentation in Section 4.1.6, Problem 1, Solution a for more detail.
3. Based on the VPO, determine which vocational education programs or employment and training programs should be grouped or clustered together for analysis purposes.	. Refer to Section 4.1.6, Problem 2, Solution a for more detail. . BLS corss-walk tape may also be a resource for establishing those relationships (see Section 4.1.6, Cross-Classification Resources).
4. Determine what follow-up information is collected pertaining to completers or leavers of vocational education or employment and training programs.	. Follow-up information is collected as part of VEDS or CETA.

(Continued on Next Page)

<table>
<tr><th>PROCEDURAL STEPS</th><th>COMMENTS/LIMITATIONS</th></tr>
<tr><td>5. Examine the classification system used to categorize the occupational field of employment for those completers/leavers who entered the labor force.</td><td>. The classificaiton systems used to report placement occupations are limited by the requirements of the current follow-up reporting systems. The following table summarizes these requirements for the principal sources of supply information.
<table>
<tr><th>Follow-up Reporting System</th><th>Classification of Occupational Employment</th></tr>
<tr><td>VEDS</td><td>SOC (two-digit)*</td></tr>
<tr><td>CETA</td><td>SOC (four-digit) or DOT equivalent</td></tr>
<tr><td>HEGIS</td><td>None</td></tr>
<tr><td>NCES Postsecondary Career School Survey</td><td>None</td></tr>
</table>
*Note: States have the option of coding the follow-up information at a more detailed level (e.g., four-digit SOC or OES Survey Code).</td></tr>
<tr><td>6. Relationships between (1) the vocational education programs and the occupations entered by completers/leavers of these programs, and (2) the employment and training programs and occupations entered by persons terminating from these programs, provide evidence of the relationships between programs and occupations. These relationships should be reflected in the units of analysis developed through the following procedures:</td><td>Evidence of relationships between education/training programs and occupations as indicated by follow-up placement data should also be supplemented or checked by using the VPO cross-walks or conferring with program planners and administrator.</td></tr>
</table>

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PROCEDURAL STEPS	COMMENTS/LIMITATIONS
. For each SOC occupational title related to a vocational education or employment and training program, determine the corresponding occupational classification from the classification structure used for the demand information.	. The cross-reference tables from Volume 2 of the VPO can be used to determine Census and OES Survey codes related to a SOC code.
. Include the corresponding occupational classification with the cluster of programs defined in Step 3 above.	
. Analyze the related SOC occupational groups for all programs included in each unit of analysis.	. This procedure effectively permits converting all SOC occupational classifications to a classification structure with which demand information is associated.
7. The end result of these procedures will be a unit of analysis containing: . vocational education and/or employment and training programs . occupational categories for which there is available demand information. See Exhibit 4.1.6-10 for a graphic summary of this procedure.	

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 2. Occupational supply and demand information are not available in the same classification structures, Therefore, how can units of analysis based on logical relationships among education/training programs and occupations be developed for use in relating occupational supply and demand information?

SOLUTION: d. Combine the three preceding alternate procedures to develop units of analysis that reflect the State and local conditions in terms of relationships between education/training programs and occupations.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Determine which classification systems are used by the available sources of occupational demand and occupational supply information in the State.	. The classification systems of the available sources of information must be reflected in the units of analysis developed to permit interfacing of demand and supply information. . Refer to the State Data Source Analysis Summary in Chapter 2
2. Develop units of analysis based on the classification system interrelationships indicated in the VPO.	. Refer to Section 4.1.6, Problem 2, Solution a for more detail. . The BLS cross-walk tape may also be a resources for establishing those relationships (see Section 4.1.6, Cross-Classification Resources).
3. Have a task force of vocational education and employment and training program planners and administrators review the units of analysis to recomment changes based on knowledge of program curriculum, occupational objectives, and past placement history.	

(Continued on next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
4. Adjust the units of analysis over time to reflect the realities of the labor market as indicated by follow-up information which summarizes the actual occupations entered by individuals from specific vocational education or employment and training programs.	
5. Continually update units of analysis based on: . Follow-up information relationships between programs and occupations . New sources of occupational demand information	. This method of developing units of analysis may be time-consuming, but will probably be the most accurate because it combines inputs from all available resources pertaining to the relationships between education/training programs and occupations.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 3. Education/training programs or occupations for which there are supply and demand data may be included in more than one unit of analysis. What methods might be used to allocate either education/training program data or occupational demand data among the units of analysis to more accurately reflect local labor market conditions?

SOLUTION: a. Allocate entrants from an education/training program or program cluster among the related occupations on the basis of annual net demand in each occupation relative to the total annual net demand for all related occupations.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify education/training programs or clusters of such programs which are related to an occupation or occupations which appear in more than one unit of analysis	See Section 4.1.6, Problem 2, Solutions a through d, for more information on units of analysis
2. For each program or program cluster identified in Step 1, determine the projected average annual net demand (openings due to growth and replacement) for each related occupation.	
3. Compute the "relative net demand share" for each related occupation using the following formula: Relative net demand share = $\frac{\text{Average annual openings in occupation n}}{\text{Sum of average annual openings in all related occupations}}$	See Exhibit 4.1.6-11 "relative net demand share" column (Column 1) for occupation A = .60 (or 60%). This is derived from the formula in Step 3 where: $\frac{600}{1000} = .60$
4. Allocate data on the measure used for available supply from each program or program cluster among the related occupations using the following formula: (Relative Net Demand Share (%)) X (Available Program Supply)= Allocated Supply to Occupation n	See Exhibit 4.1.6-11 The figure in the Relative Net Demand Share column for occupation A = 180. This is based on the Step 4 formula where: .60 X 300 = 180

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PROCEDURAL STEPS	COMMENTS/LIMITATIONS
5. Assign the allocated supply to the unit of analysis which contains the appropriate program(s) and occupation(s) for which it was computed. This serves to break out data among overlapping units of analysis	. This procedure adheres to the theoretical formulation that supply follows demand and that individuals will tend to find employment in occupations on the basis of relative demand for occupations for which they are qualified. . A variation on this procedure is to allocate supply on the basis of the relative share of total employment in each occupation related to an education/training program.
6. A further step may be conducted to portray more clearly the implications for supply/demand analysis of overlaps among units of analysis. This step involves summing the allocated supply from all programs related to an occupation and indicating this total allocated supply next to the demand for that occupation each time the occupation appears in a unit of analysis.	. See Exhibit 4.1.6-12.

EXHIBIT 4.1.6-11
EXAMPLES OF DIFFERENT PROCEDURES TO ALLOCATE SUPPLY TO OCCUPATIONAL FIELDS

Example: Program or Program Cluster 1 is related to 3 occupational fields (A, B, and C). Available supply from program or program cluster 1 = 300.

Occupational Field	Alternate Allocation Measures		Relative Net Demand		Placement Share	
	1. Relative net demand annual openings	2. Number of graduates placed from program or program cluster 1	Method of Calculation: Multiply Allocation Measure No. 1 times available supply data	Share	Method of Calculation: Multiply Allocation Measure No. 2 times available supply data	Share
Total	1,000	250	--	300	--	300
A	600 60%)	100 (40%)	.60 x 300 =	180	.40 x 300 =	120
B	300 30%)	100 (40%)	.30 x 300 =	90	.40 x 300 =	120
C	100 10%)	50 (20%)	.10 x 300 =	30	.20 x 300 =	60

The diagram below (left) depicts an example of allocating the available supply from four education/training programs (1, 2, 3, and 4) among eight related occupations (A through H). The diagram on the right demonstrates how total supply allocated to an occupation from its related programs can be obtained by summing across all the allocated portions of related program supply.

EXHIBIT 4.1.6-12

Application of Allocation Formula

Program		Occupation		Portion of Program Supply Allocated to Occupation
1	→	A	=	A_1
1	→	B	=	B_1
1	→	C	=	C_1
2	→	C	=	C_2
2	→	D	=	D_2
2	→	E	=	E_2
3	→	C	=	C_3
3	→	D	=	D_3
3	→	F	=	F_3
3	→	G	=	G_3
4	→	C	=	C_4
4	→	F	=	F_4
4	→	H	=	H_4

Procedure for Obtaining Total Supply Allocated to an Occupation

Occupation		Portion of Allocated Program Supply
A	=	A_1
B	=	B_1
C	=	$C_1 + C_2 + C_3 + C_4$
D	=	$D_2 + D_3$
E	=	E_2
F	=	$F_3 + F_4$
G	=	G_3
H	-	H_4

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 3. Education/training programs or occupations for which there are supply and demand data may be included in more than one unit of analysis What methods might be used to allocate either education/training program data or occupational demand data among the units of analysis to more accurately reflect local labor market conditions?

SOLUTION: b. Allocate entrants from an education/training program or program cluster among the related occupations on the basis of the relative share of placements from a program into each related occupation. Relative placement share can be derived from a time series of follow-up placement data sufficient to permit identification of typical placement patterns.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify education/training programs or clusters of such programs which are related to an occupation or occupations which appear in more than one unit of analysis.	
2. For each program or program cluster, identified in Step 1, use follow-up data on placement to identify the related occupations in which program completers (and leavers, if available) typically obtain employment.	
3. For each program or program cluster determine the number of program completers placed in each related occupation.	See Exhibit 4.1.6-11 for an example showing three related occupations.
4. Compute the "placement share" to each related occupation using the following formula: $\text{Placement Share} = \frac{\text{Number of program completers placed in occupation n}}{\text{Total number of program placements}}$	See Exhibit 4.1.6-11 The figure in the "placement share" column (Column 2) for occupation A = .40 (or 40%). This is derived from the formula in Step 4 where: $\frac{100}{250} = .40$

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
5. Allocate the data for the unit of measure used for available supply from each program or program cluster among the related occupations using the following formula: (Placement Share) X (Available Supply) = Allocated Supply to Occupation n	. See Exhibit 4.1.6-11. The figure in the "Placement Share" column for occupation A = .40. This is based on the Step 5 formula where .40 X 300 = 120. . For a discussion of units of measure for available supply, refer to Section 4.4.4, Measurement Issues, Entrants from Education/Training Programs.
6. Assign the allocated supply to the unit of analysis which contains the appropriate program(s) and occupation(s) for which it was computed. This serves to break out data among overlapping units of analysis.	
7. A further step may be conducted to portray more clearly the implications for supply/demand analysis of overlaps among units of analysis. This step involves summing the allocated supply from all programs related to an occupation and indicating this total allocated supply next to the demand for that occupation each time the occupation appears in a unit of analysis.	See Exhibit 4.1.6-12. An advantage of this procedure is that it reflects actual placement conditions. However, "actual placement conditions" may themselves reflect short-term economic fluctuations including such things as plant closings or the location of a new industry in the area. For this reason it is advisable to use time series placement data, which permits identification of average or "normal" placement patterns.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 3. Education/training programs or occupations for which there are supply and demand data may be included in more than one unit of analysis. What methods might be used to allocate either education/training program data or occupational demand data among the units of analysis to more accurately reflect local labor market conditions?

SOLUTION: c. Use the inverse Industry-Occupation matrix (either OES Survey- or Census-based, depending on local data availability) to identify the distribution of occupational employment and demand by industry. This information can be used to allocate occupational demand to units of analysis containing education/training programs relating to industry-specific occupations.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the occupations for which demand data are available.	
2. Examine the inverse I-O matrix to profile the industrial distribution of occupational employment. Identify cases where occupational employment is concentrated in one or a few major industries.	Concentrations will usually be more evident by divisions or major industry groups. An example might be where 60% or more of total occupational employment is accounted for by 1 to 3 major industries. Major industry groups include: . Agriculture, forestry, and fishing . Mining . Construction . Manufacturing . Transportation, communications, electric, gas, and sanitary services . Wholesale trade . Retail trade . Finance, insurance, and real estate . Services . Public administration

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
3. Examine the education/training programs related to (in the same unit of analysis as) each occupation. Determine if certain programs emphasize preparation focusing on specific industries. This might be determined in one of the following ways: . The knowledge of teachers, planners, or administrators regarding actual program curricula . The evidence of placement data, if it indicates the employer or industry where placements occur	
4. Matches between identified industrial focus of a program (from Step 3) and the shares of industry-specific employment in an occupation might be used to allocate portions of occupational demand to appropriate units of analysis.	The portion of occupational demand would be that part within a specific major industry sector as identified from the I-O matrix, as opposed to total occupational employment demand across all industries. Note: The inverse I-O matrix may also provide an indication of occupations which may be only marginally related to a specific program or unit of analysis. For example, the Census occupation Technicians, except Health, may appear as related to a USOE program in Agriculture (01). Examination of the inverse matrix will show that the Agriculture industry accounts for only 2% of total employment in that occupation. Most of the employment in that occupation is concentrated in Air Transportation (27%), Services (12%), and Government (36%), indicating that the demand for that occupation should primarily be assigned (allocated) to units of analysis reflecting those program areas

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 3. Education/training programs or occupations for which there are supply and demand data may be included in more than one unit of analysis. What methods might be used to allocate either education/training program data or occupational demand data among the units of analysis to more accurately reflect local labor market conditions?

SOLUTION: d. Allocate occupational demand information to education/training programs based on the size of each program or program cluster as measured either by completers or related placements relative to the total level of completions or related placements for all related programs or program clusters.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify occupations which appear in more than one unit of analysis.	. These occupations will be related in some way to the education/training program or cluster of programs found in each unit of analysis in which the occupations appear.
2. For each occupation identified in Step 1, determine the "size" of each related program or program cluster, as measured by: . Completers, or . Completers obtaining related employment	
3. Consistently using one measure selected in Step 2, compute for each program or program cluster the relative share of the total related program "size" using the following formula: $\text{Relative Size Share} = \frac{\text{Program or Program Cluster Size Measure}}{\text{Total "size" of all related programs or program clusters}}$	See example Exhibit 4.1.6-13. The figure in Column 1 under "Allocation Measure" for Program A = .40 (or 40%) based on the Step 3 formula where $\frac{20}{50} = .40$.

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
4. Allocate the occupational demand to each related program or program cluster using the following formula: (Relative Size Share) X (Occupational Demand) = Demand Allocated to Program or Program Cluster A.	See Exhibit 4.1.6-13. The figure in the Relative Program Size Share column for Program A = 80. This is derived from the Step 4 formula where .40 X 200 = 80.

EXHIBIT 4.1.6-13

EXAMPLE OF PROCEDURE TO ALLOCATE DEMAND DATA TO SUPPLY

Example: Occupation X is related to three programs or program clusters (A, B, and C). Projected job openings are 200 for this occupation.

Program Cluster	Allocation Measure	Relative Program Size Share	
	1. Number of Students Who: a. Completed or b. Obtained Related Employment	Method of Calculation: Multiply Allocation Measure No. 1 Times Demand Data	Share
Total	50	--	200
A	20 (40%)	.40 x 200 =	80
B	10 (20%)	.20 x 200 =	40
C	20 (40%)	.40 x 200 =	80

4.2 GEOGRAPHIC AREA ISSUES

4.2.1 INTRODUCTION

BACKGROUND

Reconciling the geographic coverage of existing occupational supply and demand sources with the preferences of data users is one of the major issues in OIS development. Data may be available for such varied geographic units as a local jurisdiction (such as a school district), a local labor market area (LMA), or the State as a whole. This variation exists within subcomponent (e.g., geographic coverage of CETA prime sponsors vs. vocational education) as well as between subcomponents (education/training programs). User needs and preferences may vary by agency and are not necessarily aligned with the coverage of available data.

The descriptions of the problems and solutions in this section repeatedly refer to "desired geographic area(s)". The desired area(s) can be defined as the area(s) that best meet user needs and preferences while still recognizing the geographic dimensions of the major occupational supply and demand data sources. The desired area is based on the initial product description (Step 3 in the OIS product development process). The geographic area coverage of the final product may change as the problems discussed in this section are resolved.

USER NEEDS

The dimensions of geographic area information needed or preferred by data users can be identified from four different resources, as discussed below:

- Legislation/Regulation--Federal and State legislation and related regulations may specify geographic levels to be considered by various programs. For example, the Vocational Education Act of 1963 (as amended) requires the State agency responsible for administering public vocational education to develop a State plan showing State-wide supply/demand information.

- Standards/Guidelines--Federal or State agencies may have standards or guidelines that relate to the appropriateness of different geographic levels of supply/demand analysis. For example, NOICC adopted the labor market area or labor area concept, as defined by the Department of Labor, as the basic geographic subdivision for development and use of occupational information. The Employment and Training Administration's publication, Directory of Important Labor Areas, presents the following definition:

> A labor area is defined as a geographical area consisting of a central city or cities and the surrounding territory within commuting distance. Conceptually, it is an economically integrated unit within which workers may readily change jobs without changing their place of residence. The labor area takes its name from the central city (or cities), but may include one or more entire counties, except in New England where towns are considered the major geographical units.[1]

- Needs Assessment Studies--Surveys of occupational information needs and preferences of agency personnel provide an additional measure of user needs. Surveys have been conducted for a variety of Federal, State, and local agencies and job positions, such as the needs assessments studies conducted by SOICCs. While the specific contents of these studies may vary, they generally describe the geographic level needed and/or preferred by personnel in the SOICC member agencies. Table 1-1 in Volume 1 (page 1-9) presents a listing of recent publications documenting occupational information needs of various users.

- Agency Administrative Structure--The regional structure of the agencies that use occupational information may also provide insights into the geographic dimensions of user needs. Local agencies that attempt to meet the education and training needs of their areas, such as local school districts and CETA prime sponsors, have an interest in analysis at the geographic level they serve.

The four resources described above can provide the geographic coverage of user needs. It should be noted that the composite profile for all users may not result in a simple rating of different geographic levels. A more likely outcome is that users will prefer supply/demand data covering a variety of inconsistent and overlapping geographic areas.

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[1] Directory of Important Labor Areas (U.S. Department of Labor, Employment and Training Administration, 1978), p.1.

ISSUE DIMENSIONS

The various data sources break down data into a variety of geographic classifications. To facilitate analysis, a Data Source Coverage Table that identifies the range of geographic areas for which data may be available has been developed. A sample Data Source Coverage Table appears on the following page in Exhibit 4.2.1-1. The geographic areas used in the Table are listed below and defined where appropriate:

- National
- Census Regions--four regions with seven geographic divisions used by the Bureau of the Census
- Federal Regions--10 regions used by U.S. Government agencies
- State
- Standard Metropolitan Statistical Area (SMSA)--Bureau of the Census term to designate a given metropolitan area that contains at least one city of 50,000 inhabitants or more or twin cities with a combined population of at least 50,000
- Labor Market Area (LMA)--defined in the text discussion of User Needs--Standards/Guidelines (above)
- County (or parish)
- Planning District--varies by State and agency, usually a multi-county administrative area
- Prime Sponsor--CETA regional structure; coverage varies by population and local option; may be city, parts of counties, or combined counties
- Employment Service (ES) Local Office--ES regional administrative structure; may vary widely in size.
- Local Educational Agency (LEA)/School District--public school regional administrative structure; may be county or subcounty area, depending on State
- ZIP Code--Post Office regional structure

- Institution--geographic coverage of education/training programs may vary widely from State and multi-State area to local area

- Other--other geographic area (such as Job Corps Center Service Area)

The Data Source Coverage Tables presented in each of the following sections identify the specific geographic coverage of major data sources.

STRUCTURE OF SECTION 4.2

Geographic area coverage issues are described in this section as they apply to each OIS subcomponent. They are presented in the following subsections on the indicated pages:

Subsection Number	Subsection Title	Page(s)
4.2.2	Long-Term Demand	4.2.-6
4.2.3	Current and Short-Term Demand	4.2.-11
4.2.4	Entrants from Education/Training Programs	4.2.-19
4.2.5	Jobseekers	4.2-30
4.2.6	Supply/Demand Interface	4.2-36

The following topics are addressed within each section:

- Data Source Coverage
- Problem Statement
- Problems
- Solutions
- Procedural Steps for Problem Resolution

4.2.2 LONG-TERM DEMAND

DATA SOURCE COVERAGE

The Occupational Employment Statistics Program (OES) constitutes the major source of long-term demand information. Data Source Coverage Table 4.2.2, on the following page, presents geographic coverage of the OES program components. While the OES program is recognized as the most detailed and comprehensive source of occupational demand data, its geographic coverage is limited. The methodology currently used to develop the projections of long-term demand through the OES Survey-based matrix is available for States and major SMSAs. The Census-based matrix projections can be produced for States, SMSAs, and labor market areas having populations of more than 50,000. While research is currently being conducted to develop an OES methodology that is reliable at smaller sub-State areas, the feasibility of a replicable approach remains to be established. Furthermore, projections are sufficiently costly and time-consuming that even if reliability for smaller areas is achieved there may still be a limit on the size and number of areas for which it is possible to develop employment projections.

PROBLEM BACKGROUND

The long-term demand geographic area problem results from potential user needs for information at a more localized level than that available from the OES program.

	Page Number
PROBLEM:	
1. If supply/demand products are to be produced for sub-State areas that are not covered by the OES program, how can other sources of demand data be used to facilitate a sub-State supply/demand analysis?	
SOLUTIONS:	
a. Develop a more localized demand analysis than that available from the OES program by identifying relative occupational demand from State-wide long-term projections and then focusing the interpretation of the State-wide data through a supplementary analysis of sources of current/short-term demand data that cover the desired sub-State areas.	4.2-8
b. Encourage users to accept supply/demand analysis for areas covered by the OES program.	4.2-10

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. If supply/demand products are to be produced for sub-State areas which are not covered by the OES program, how can other sources of demand data be used to facilitate a sub-State supply/demand interface?

SOLUTION: a. Develop a more localized demand analysis than that available from the OES program by identifying relative occupational demand from State-wide long-term projections and then focusing the interpretation of the State-wide data through a supplementary analysis of sources of current/short-term demand data that cover the desired sub-State areas.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the geographic coverage of existing long-term projected occupational demand data.	Use State Data Source Analysis Summary described in Chapter 2.
2. Identify what sources of current/short-term demand data are available.	See the Data Source Coverage Table in Section 4.2.3.
3. Determine which geographic areas are covered by the alternate data source(s) and if these will cover some or all of the areas designated for the supply/demand interface.	
4. Use the long-term demand data on total employment and average annual openings at the State level to identify relative occupational employment demand, perhaps by ranking the occupations.	

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PROCEDURAL STEPS	COMMENTS/LIMITATIONS
5. Supplement the analysis from Step 4 by examining the alternate demand data for the desired sub-State areas, using this as a proxy to interpret and analyze the State-wide indicators.	Alternate sources of demand data might provide the following types of additional information: . May indicate that a specific occupation does not exist in a local area . May indicate that an occupation that is expected to grow substantially at the State level appears to be declining in a local area . May indicate a different relative ranking of occupations in terms of employment opportunities at the local level versus those at the State level Limitation: If ES data is used as a supplementary source of current/short-term demand data it may be misleading as an indicator of the presence of certain occupations within a labor market because it is characterized by coverage gaps. Also it can only be used for an analysis of relative demand because it covers only a relatively small share of total job vacancies.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. If supply/demand products are to be produced for sub-State areas which are not covered by the OES program, how can other sources of demand data be used to facilitate a sub-State supply/demand interface?

SOLUTION: b. Encourage users to accept supply/demand analysis for areas covered by the OES program.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the geographic coverage of the OES program in the State.	Use State Data Source Analysis Summary described in Chapter 2.
2. Meet with user groups and describe available data and advantages of using OES-covered areas.	Advantages can be defined in both financial and theoretical terms (see ETA's definition of labor market at the beginning of Section 4.2).
3. Include rationale for geographic coverage in final product.	

4.2.3 CURRENT AND SHORT-TERM DEMAND

DATA SOURCE COVERAGE Data Source Coverage Table 4.2.3 presents the geographic area coverage of 13 different sources of current and short-term occupational demand. The available sources include components of the OES program, components of the Employment Service operations, and a variety of specialized programs. The OES program and Employment Service operations are the two most comprehensive sources in terms of occupational and geographic coverage.

PROBLEM BACKGROUND The short-term demand problem in geographic coverage results from potential user needs for information at a geographic level not identical to available data sources.

	Page Number
PROBLEM:	
1. How can current or short-term demand data be incorporated into supply/demand analysis if they are not available for the desired geographic area(s)?	
SOLUTIONS:	
a. If the desired geographic area(s) are broader than the areas covered by a data source, reformat or aggregate the data to the desired area(s).	4.2-15
b. Include data on current/short-term demand from sources that may not match exactly (e.g., ES local office), but which can be related to the desired geographic area(s).	4.2-16
c. Limit geographic coverage to the smallest geographic area which is common to the different data sources in this subcomponent.	4.2-17
d. Encourage users to accept supply/demand analysis for geographic areas for which data are available.	4.2-18

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. How can current or short-term demand data be incorporated into supply/demand analysis if it is not available for the desired geographic area(s)?

SOLUTION: a. If the desired geographic area(s) are broader than the area covered by a data source, reformat or aggregate the data to the desired area(s).

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the most detailed geographic unit of measure available for each source of current/short-term demand data to be used. 2. Compare the geographic unit identified in Step 1 with the geographic areas which are desired. 3. Determine which of the sources of current/short-term demand data has sufficiently detailed geographic units that they can be aggregated to match the desired geographic areas. 4. For those sources identified in Step 3, aggregate the data to the appropriate geographic level.	Review Data Source Coverage Table 4.2.3 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. How can current or short-term demand data be incorporated into supply/demand analysis if they are not available for the desired geographic area(s)?

SOLUTION: b. Include data on current/short-term demand from sources that may not match exactly (e.g., ES Local Office), but which can be related to the desired geographic area(s).

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the geographic areas covered by each source of current/short-term demand data to be included.	Review Data Source Coverage Tables 4.2.3 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Compare the geographic areas covered by the various data sources with the geographic areas desired.	Transparent overlay maps of the areas used in each different data source may assist in this step.
3. Determine the extent of overlap between the desired geographic area and the areas used in the data sources to be included.	
4. Where the majority of a geographic area used in a data source falls within the desired area, even if the overlap is not perfect, include the data from that source within the chosen area.	The method for determining whether the majority of the area matches will depend upon the analyst's judgment; one way of doing this is identifying which cities and towns are included in each area and comparing the number of them that both areas have in common. Where population data are available, the relative coverage of population between the two areas might be used as the criteria for matching them. Aggregation of some of the areas used in a data source may produce a closer match in some cases.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. How can current or short-term demand data be incorporated into supply/demand analysis if they are not available for the desired geographic area(s)?

SOLUTION: c. Limit geographic coverage to the smallest geographic area which is common to the different data sources in this subcomponent.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the geographic unit used in each source of current/short-term demand data to be included.	Review Data Source Coverage Table 4.2.3 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Identify the geographic units used by the other data sources, whether demand or supply data, which are to be combined in the supply/demand analysis.	
3. Compare the geographic reporting areas used by the various data sources.	Transparent overlay maps of the areas used in each different data source may assist in this step.
3. Determine the smallest geographic area which is common to all the data sources to be combined.	Limitation: The smallest area common to all sources may be the State.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. How can current or short-term demand data be incorporated into supply/demand analysis if they are not available for the desired geographic area(s)?

SOLUTION: d. Encourage users to accept supply/demand analysis for geographic areas for which data are available.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the geographic coverage of available sources of current and short-term demand data.	Review Data Source Coverage Table 4.2.3 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Meet with user groups and describe available data and advantages of using the geographic areas identified in Step 1.	
3. Include in final product the rationale for geographic coverage.	

4.2.4 ENTRANTS FROM EDUCATION/TRAINING PROGRAMS

DATA SOURCE COVERAGE

Data Source Coverage Table 4.2.4 presents the geographic coverage of 20 different sources of data on entrants from education/training programs and demonstrates the wide range of geographic coverage in this area. This variety results from the varied nature of educational institutions and employment and training agencies, each of which has its own administrative regions and its own data collection and reporting systems and procedures. This variety of geographic areas provides both greater flexibility to manipulate data from certain sources to match the desired geographic areas, as well as potentially greater problems in matching successively more sources to the same area. The more localized the data on entrants from education/training programs are, the more likely it will be possible to aggregate or reformat the data to the desired geographic area.

PROBLEM BACKGROUND

Users may request supply/demand interfaces for specified geographic areas and at the same time want them to be comprehensive in their inclusion of data on entrants from education/training programs from as many sources as possible.

	Page Number
PROBLEM:	
1. The geographic coverage of the sources of data on entrants from education/training programs varies significantly. How can data from these sources be related to the desired geographic area(s)?	
SOLUTIONS:	
a. If the desired geographic area(s) are broader than the area covered by a data source, reformat or aggregate the data to the desired area(s).	4.2-26
b. Include data on entrants from education/training programs from sources that may not match exactly but that can be related to desired geographic area(s).	4.2-27

(Continued on Next Page)

	Page Number
SOLUTIONS: (continued)	
c. Limit geographic coverage to the smallest geographic area that is common to the different data sources in this component.	4.2-28
d. Present available supply data on entrants from education/training programs in a format that will accommodate and appropriately identify inconsistent geographic areas.	4.2-29

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. The geographic coverage of the sources of data on entrants from education/training programs varies significantly. How can data from these sources be related to the desired geographic area(s)?

SOLUTION: a. If the desired geographic area(s) are broader than the area covered by a data source, reformat or aggregate the data to the desired area(s).

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the most detailed geographic unit of measure available for each source of data on entrants from education/training programs.	Review Data Source Coverage Table 4.2.4 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Compare the geographic unit identified in Step 1 with the geographic area which is desired for the final supply/demand interface.	Transparent overlap maps of the areas used in each different data source may assist in this step.
3. Determine which of the sources of data on entrants from education/training programs can be aggregated to match the desired geographic areas.	
4. For those sources identified in Step 3, aggregate the data to the appropriate geographic level.	

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. The geographic coverage of the sources of data on entrants from education/training programs varies significantly. How can data from these sources be related to the desired geographic area(s)?

SOLUTION: b. Include data on entrants from education/training programs from sources that may not match exactly but that can be related to the desired geographic area(s).

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the geographic areas covered by each source of data on entrants from education/training programs to be included.	Review Data Source Coverage Table 4.2.4 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Compare the geographic areas covered by each data source with the geographic areas desired for the final supply/demand interface.	Transparent overlay maps of the areas used in each different data source may assist in this step.
3. Determine the extent of overlap between the desired geographic areas and the areas used in the data source to be included.	
4. Where the majority of a geographic area used in a data source falls within the desired area, even if the overlap is not perfect, include the data from that source within the chosen area.	The method for determining whether the majority of the area matches will depend upon the analyst's judgment; one way of doing this is identifying which cities and towns are included in each area and comparing the number of them that both areas have in common. Where population data are available, the relative coverage of population between the two areas might be used as the criteria for matching them. Aggregation of some of the areas used in a data source may produce a closer match in some cases.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. The geographic coverage of the data sources of data on entrants from education/training programs varies significantly. How can data from these sources be related to the desired geographic area(s)?

SOLUTION: c. Limit geographic coverage to the smallest geographic area that is common to the different data sources in this subcomponent.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the geographic units used in each source of data on entrants from education/training programs to be included.	Review Data Source Coverage Table 4.2.4 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Identify the geographic units used by the other data sources, whether demand and/or supply data, which are to be combined in the supply/demand interface.	
3. Compare the geographic reporting areas used by the various data sources.	Transparent overlay maps of the areas used in each different data source may assist in this step.
4. Determine the smallest geographic area which is common to all the data sources to be combined.	Limitation: The smallest area common to all sources may be the State.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. The geographic coverage of the sources of data on entrants from education/training programs varies significantly. How can data from these sources be related to the desired geographic area(s)?

SOLUTIONS: d. Present available supply data on entrants from education/training programs in a format that will accommodate and appropriately identify inconsistent geographic units.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the geographic coverage of each source of data on entrants from education/training programs.	Review Data Source Coverage Table 4.2.4 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Include the data on these entrants in the supply/demand interface using the geographic areas for which they are available.	
3. Appropriately label the geographic coverage of the data from each source.	Limitation--Users may not fully take into account the implications of the varying geographic coverage of the different sources.

4.2.5 JOBSEEKERS

DATA SOURCE COVERAGE

Although there are usually fewer different sources of data on jobseekers than there are on entrants from education/training programs, there is still a range of geographic area coverage (See Data Source Coverage Table 4.2.5). Data on agency registrants with the Employment Service, for example, may be available from the national and State level down to ES local office level. Data on military discharges entering the civilian labor force can be obtained by ZIP Code area. Since the most detailed level of geographic coverage available from these sources will probably not correspond perfectly with the geographic areas selected for the supply/demand interface some manipulation of data on jobseekers may be necessary.

PROBLEM BACKGROUND

The inclusion of supply data on jobseekers in the final supply/demand interface may be desired to obtain a more comprehensive picture of occupational supply.

	Page Number
PROBLEM:	
1. The geographic coverage of the sources of data on jobseekers varies. How can data from these sources be related to the desired geographic area(s)?	
SOLUTIONS:	
a. If the desired geographic area(s) are broader than the area(s) covered by a data source, reformat or aggregate the data to the desired area(s).	4.2-32
b. Include data on jobseekers from sources that may not match exactly but that can be related to the desired geographic area(s).	4.2-33
c. Limit geographic coverage to the smallest geographic area that is common to the different data sources in this component.	4.2-34
d. Present available supply data on jobseekers in a format that will accommodate and appropriately identify inconsistent geographic units.	4.2.35

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. The geographic coverage of the sources of data on jobseekers varies. How can data from these sources be related to the desired geographic area(s)?

SOLUTIONS: a. If the desired geographic area(s) are broader than the area covered by a data source, reformat or aggregate the data to these desired area(s).

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the most detailed geographic unit of measure available for each source of data on jobseekers to be used. 2. Compare the geographic unit identified in Step 1 with the geographic area which is desired for the supply/demand interface. 3. Determine which of the sources of data on jobseekers have sufficiently detailed geographic units that can be aggregated to match the desired geographic areas. 3. For those sources identified in Step 3, aggregate the data to the appropriate geographic level.	Review Data Source Coverage Table 4.2.5 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. The geographic coverage of sources of data on jobseekers varies. How can data from these sources be related to the desired geographic area(s)?

SOLUTION: b. Include data on jobseekers from sources that may not match exactly but that can be related to the desired geographic area(s).

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the geographic areas covered by each source of data on jobseekers to be included.	Review Data Source Coverage Table 4.2.5 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Compare the geographic areas covered by each data source with the geographic areas desired for the final supply/demand interface.	Transparent overlay maps of the areas used in each different data source may assist in this step.
3. Determine the extent of overlap between the desired geographic areas and the areas used in the data source to be included.	
4. Where the majority of a geographic area used in a data source falls within the desired area, even if the overlap is not perfect, include the data from that source within the chosen area.	The method for determining whether the majority of the area matches will depend upon the analyst's judgment; one way of doing this is identifying which cities and towns are included in each area and comparing the number of them that both areas have in common. Where population data are available, the relative coverage of population between the two areas might be used as the criteria for matching them. Aggregation of some of the areas used in a data source may produce a closer match in some cases.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. The geographic coverage of sources of data on jobseekers varies. How can data from these sources be related to the desired geographic area(s)?

SOLUTION: c. Limit geographic coverage to the smallest geographic area that is common to the different data sources in this subcomponent.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the geographic unit used in each source of data on jobseekers.	Review Data Source Coverage Table 4.2.5 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Identify the geographic units used by the other data sources, whether demand and/or supply data, which are to be combined in the supply/demand interface.	
3. Compare the geographic reporting areas used by the various data sources.	Transparent overlay maps of the areas used in the different data sources may assist in this step.
4. Determine the smallest geographic area that is common to all of the data sources to be combined.	Limitation: The smallest area common to all sources may be the State.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. The geographic coverage of sources of data on jobseekers varies. How can data from these sources be related to the desired geographic area(s)?

SOLUTION: d. Present available supply data on jobseekers in a format that will accommodate and appropriately identify inconsistent geographic units.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the geographic unit of measure used by each source of data on jobseekers.	Review Data Source Coverage Table 4.2.5 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Include the data on jobseekers in the supply/demand interface using the geographic areas for which they are available.	
3. Appropriately label the geographic coverage of the data from each source.	Limitation: Users may not fully take into account the implications of the varying geographic coverage of the different sources.

4.2.6 SUPPLY/DEMAND INTERFACE

DATA SOURCE COVERAGE

User needs and specifications regarding the geographic level of supply/demand interface, along with the constraints of the various demand and supply data sources themselves (discussed in Sections 4.2.2 through 4.2.5), will usually dictate the level and number of geographic areas that can or should be used for the supply/demand interface. However, there is another factor to consider with regard to this issue. The actual labor market which is appropriate for analysis may vary by occupation. The labor market for some occupations is national; for others it is regional (multi-State) or State; for the majority it will typically be a sub-State area.

PROBLEM BACKGROUND

Some institutions or agencies that provide training programs may serve a fairly large geographic area and may prepare individuals for occupations for which employment opportunities extend beyond the immediate local labor market area. These users may request supply/demand analyses that reflect the larger labor market area of the occupations for which the provide training.

	Page Number
PROBLEM: 1. What methods can be used to determine the functional labor market area for particular occupations when that area exceeds the local labor market area in geographic coverage?	
SOLUTIONS: a. Identify historical patterns of geographic migration and data on the location of labor market entry of individuals from education/training programs by using program follow-up information in order to determine the appropriate geographic unit of supply/demand interface.	4.2-38
(Continued on Next Page)	

	Page Number
SOLUTIONS (continued):	
b. Use the same geographic area for all occupations. Supplement this with data covering a larger geographic area for selected occupations.	4.2-40
c. Determine the DOT Codes related to each occupation and analyze the range and frequency of the Specific Vocational Preparation (SVP) and General Educational Development (GED) ratings associated with those related DOT codes.	4.2-41

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. What methods can be used to determine the functional labor market area for particular occupations when that area exceeds the local labor market area in geographic coverage?

SOLUTION: a. Identify historical patterns of geographic migration and data on the location of labor market entry of individuals from education/training programs by using program follow-up information in order to determine the appropriate geographic unit of supply/demand interface.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Determine which sources of data systematically collect and provide follow-up information on entrant from education/training programs.	Review Data Source Coverage Table 4.2.4 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Determine if the follow-up information available provides sufficient data on the geographic patterns of postprogram migration and placement.	
3. If geographic patterns can be identified, determine whether these can be related back to education/training programs and whether they are placement occupation-specific or not.	
4. For each education/training program or program cluster identify the patterns of geographic distribution of placed individuals. For example, determine if entrants obtained employment in the same local labor area or if they migrated to other areas within the State or to other States. If occupation-specific data is available, determine if these patterns of geographic migration vary by occupation of placement.	

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
5. Designate an appropriate geographic area of analysis for each unit of analysis based on the historical patterns of geographic entry into the labor market identified in Step 4.	

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. What methods can be used to determine the functional labor market area for particular occupations when that area exceeds the local market labor area in geographic coverage?

SOLUTION: b. Use the same geographic area for all occupations. Supplement this with data covering a larger geographic area for selected occupations.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Review the geographic level of detail for the major sources of occupational supply and demand information in the State.	Review Data Source Coverage Tables from Section 4.2 and the related State Data Source Analysis Summaries.
2. Determine for what geographic levels within the State both occupational supply and demand information are available.	
3. Restrict the geographic level of the interface of quantitative occupational supply and demand information to areas for which occupational supply and demand information is readily available without unreliable manipulations.	
4. Supplement the quantitative occupational supply and demand information analysis conducted at the State and SMSA levels with the local information that can aid the qualitative assessment of the supply/demand situation, or with national or regional data where appropriate.	Refer to Sections 5.3 and 5.4 for a further discussion of the qualitative considerations in the supply/demand analysis process.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. What methods can be used to determine the functional labor market area for particular occupations where that area exceeds the local labor market area in geographic coverage?

SOLUTION: c. Determine the DOT codes related to each occupation and analyze the range and frequency of the Specific Vocational Preparation (SVP) and General Educational Development (GED) ratings associated with those related DOT codes.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the occupations or clusters of occupations to be included in the supply/demand interface.	See discussion in section 4.1.
2. Determine the specific DOT occupations that are included in each occupation or cluster of occupations.	
3. Develop a range of the SVP values for all of the DOT titles that are included in each occupation or cluster of occupations. Develop a similar range for the GED values associated with the DOT titles. The ranking scales for GED and SVP are as follows (See Section 4.3.2 in Volume 1 of the OIS Handbook): Element Being Measured (GED) — Ranking Scale 1--Reasoning Development — 1 Lowest, 6 Highest 2--Mathematical Development — 1 Lowest, 6 Highest 3--Language Development — 1 Lowest, 6 Highest	

(Continued on Next Page)

<table>
<tr><th>PROCEDURAL STEPS</th><th>COMMENTS/LIMITATIONS</th></tr>
<tr><td>
<table>
<tr><th>SVP Level</th><th>Time</th></tr>
<tr><td>1</td><td>Short demonstration only</td></tr>
<tr><td>2</td><td>Anything beyond short demonstration up to and including 30 days</td></tr>
<tr><td>3</td><td>Over 30 days up to and including 3 months</td></tr>
<tr><td>4</td><td>Over 3 months up to and including 6 months</td></tr>
<tr><td>5</td><td>Over 6 months up to and including 2 years</td></tr>
<tr><td>6</td><td>Over 1 year up to and including 2 years</td></tr>
<tr><td>7</td><td>Over 2 years up to and including 4 years</td></tr>
<tr><td>8</td><td>Over 4 years up to and including 10 years</td></tr>
<tr><td>9</td><td>Over 10 years</td></tr>
</table>
</td><td></td></tr>
<tr><td>Develop a frequency count of the ratings for all the DOT titles included in each cluster.</td><td>Presumably, occupations or clusters of occupations with the greatest frequency of high levels of vocational preparation (SVP) or GED would have a broader geographic level of analysis (e.g., State, regional, or national).
Conversely, occupations or clusters of occupations requiring less vocational preparation (SVP) or lower levels of GED would have a narrower, more localized geographic level of analysis (e.g., sub-State area).
(These assumptions remain to be validated by further research.)</td></tr>
</table>

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
4. Develop a relative rating scale that ranks each occupation or cluster of occupations according to its most frequent GED and SVP values. 5. Establish guidelines for determining the appropriate geographic level of analysis based on the relative ranking of the units of analysis.	

4.3 TIME PERIOD ISSUES

4.3.1 INTRODUCTION

BACKGROUND

A number of time period issues must be addressed at different stages of the OIS development process. The initial description of the OIS product (Step 3) includes a statement of the "desired time period." This can be defined as the time period that best meets user needs while still recognizig the time period dimensions of the major occupational supply and demand data sources. One time period issue is the distinction between long-term and short-term supply/demand relationships. Data for long-term analysis would be used for long-range planning and would contain data from long-term projections of occupational demand. Short-term supply/demand analysis would be based on current or short-term demand data (typically, job vacancies) and could be used in planning for programs that may have a fairly rapid start-up and turnaround time (e.g., a CETA subcontract to a school for three- to nine-month program might start almost immediately because the program mechanisms may already be in place).

Another aspect of the time period issue separate from the choice between a long-term versus a short-term supply/demand interface is that data sources may differ on three dimensions of time period coverage:

- The units of time for which data are provided, i.e., monthly, quarterly, or annually (which can be a calendar year, school year, or fiscal year)
- The actual dates of the period(s) covered
- How frequently new data becomes available

Data from different sources may not be available until well after the period which they cover. This creates problems in trying to combine data from several sources to cover a specific time period.

USER NEEDS

Users need supply/demand analyses for a variety of purposes which affect the time period coverage desired, including:

- Management and decisionmaking tools to evaluate the need to start-up and/or terminate education and training programs

- Planning tools to fulfill program plan (annual and/or five-year) requirements, on the Federal, State, and local levels, which often request supportive data covering specific reference periods

- Guidance tools to aid in the determination of individual career choices

These various applications of a supply/demand analysis may indicate the appropriate time period coverage.

The dimensions of time period coverage of information needed or preferred by data users can be identified from three different resources, as discussed below:

- Legislation/regulation--Federal and State legislation and related regulations may identify time periods appropriate for supply/demand analysis in various programs. An example of this is the rules and regulations associated with the Vocational Education Act of 1963, as amended. The regulations contain the following language (Sec. 1074(b); 20 U.S.C. 2307.):

  > "Assessment of employment opportunities.
  >
  > (a) The five-year State plan shall include an assessment of current and future needs for workers (job skills) within the State and, where appropriate, within the pertinent region of the country.
  >
  > (b) This assessment shall reflect the latest available data of present and projected employment, including the data available from the State occupational information coordinating committee."

- Needs assessment studies--Surveys of occupational information needs and preferences of agency personnel provide an additional measure of user needs. Thus, surveys have been conducted for a variety of Federal, State, and local agencies and job functions within these agencies. An example of these studies are the needs assessment studies by SOICCs. While the particulars of these studies may vary, they generally assess the following time dimensions:

  - Preferred unit of time for data (i.e., monthly, quarterly, school year, calendar year or fiscal year)

- Preferred time period coverage--for data (e.g., current year, projected year)

- Frequency of data update (e.g., monthly, quarterly, annually)

Table 1-1 in Volume 1 (Page 1-9) presents a listing of recent publications documenting occupational information needs of various users.

. Length of training time--An assessment of the length of training programs offered by different agencies may indicate user preferences for the time period coverage of a supply/demand product. Planners or administrators of programs lasting two to four years, such as apprenticeships, would tend to be interested in long-term demand projections.

Persons responsible for programs lasting less than one year may be interested in current and short-term demand data, since such data represent the situation current enrollees will encounter after completing the program.

TIME PERIOD DIMENSIONS

Data Source Coverage Tables are provided for each of the OIS subcomponents in this section. See Exhibit 4.3.1-1 on the following page for a sample Data Source Coverage Table. The exhibit lists 14 different categories of possible time period coverage. These categories range from Projection (point in time) to Daily. The following time period coverage categories appear on the Table:

. Projection (point in time)--Projections are estimates of the level of a factor at a specified future time.

. Projection Period--Projection periods represent the time covered between a specified base year (often current year) and the projection year. Data on projection periods are often presented as the average value for each year in the projection period (average annual).

. Calendar Year--data may be available for a calendar year and may be collected quarterly, monthly, or daily. An average annual figure may be obtained by averaging the levels of a factor at different reporting periods (e.g., monthly) during the year.

. Federal Fiscal Year--The federal fiscal year begins October 1 and ends on September 30 of the succeeding calendar year.

- Other Fiscal Year--Governmental bodies such as State, County, or City governments may employ a fiscal year different from that used by the Federal government. A common alternative fiscal year runs from July 1 to June 30 of the succeeding calendar year.

- School Year--The time period designated as a school year may vary extensively by location and by institution, particularly among postsecondary schools. However, a traditional school year usually covers the nine months from September of one year to June of the succeeding calendar year (for fiscal and budgetary purposes, the school year might be designated as the full 12 month period, i.e., from September through the end of August).

The following seven terms typically refer to the frequency with which data are collected and/or reported and are for the most part self-explanatory:

- Biennially--once every two years
- Annually
- Semi-annually--twice a year
- Quarterly--four times a year, every three months
- Monthly
- Weekly
- Daily (or continuously)--this means essentially that data are updated on a continual basis

The last column, "Other", refers to time periods other than those described above. An example is the decennial collection cycle of the Census of Population.

STRUCTURE OF SECTION 4.3

Time period issues are described in this section as they apply to each OIS subcomponent. They are presented in the following subsections on the indicated pages:

Subsection Number	Subsection Title	Page
4.3.2	Long-Term Demand	4.3-7
4.3.3	Current and Short-Term Demand	4.3-14

Subsection Number	Subsection Title	Page
4.3.4	Entrants from Education/Training Programs	4.3-21
4.3.5	Jobseekers	4.3-36
4.3.6	Supply/Demand Interface	4.3-40

The following topics are addressed within each subsection:

- Data Source Coverage
- Problem Background
- Problem(s)
- Solutions
- Procedural Steps for Problem Resolution

4.3.2 LONG-TERM DEMAND

DATA SOURCE COVERAGE

The OES program, the major source of long-term demand data, covers several time periods, as shown by Data Source Coverage Table 4.3.2.

The OES program provides data on total industry and occupational employment for a base year and projected year plus the average annual job openings by occupation resulting from both growth and replacement needs. The actual time period(s) covered by sources of long-term demand data will vary by State, according to:

- The projections program used (e.g., OES Survey-based or Census-based)
- The schedule for data collection to update the program (e.g., new surveys or benchmarking to more recent industry employment figures)

PROBLEM BACKGROUND

Typically, programs that project long-term employment demand will cover the time period desired by users of long-term supply/demand analyses; however, the base-year employment data may not match the year(s) selected for the supply/demand interface bacause of the time lag between obtaining the data for the base year and the actual publication of the completed projections. This time lag means that part of the projection period has already passed when the data becomes available.

	Page Number
PROBLEM:	
1. Employment projections methodologies may not account for changes in economic conditions arising after the base-year employment data were obtained and the projections were produced. How can the effects of such changes in industry employment levels, share, or distribution be taken into consideration when long-term demand data are used in developing a supply/demand product?	
SOLUTIONS:	
a. For sources of projected long-term demand data for which the base-year employment is not considered sufficiently current, compare the data on both industrial and occupational employment with more recent sources of data on employment, such as the ES-202, BLS790, the OES Survey, and the CPS, to identify changes between the projections base-year and the most recent year available from these supplemental sources.	4.3-11
b. For sources of projected long-term demand for which the base-year employment data is not considered sufficiently current, analyze the base-year occupational employment data for indications of relative rather than absolute levels of employment.	4.3-13

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEMS

1. Employment projections methodologies may not account for changes in economic conditions arising after the base-year employment data were obtained and the projections were produced. How can the effects of such changes in industry employment levels, share or distribution be taken into consideration when long-term demand data are used in developing a supply/demand product?

SOLUTION:

a. For sources of projected long-term demand data for which the base-year employment is not considered sufficiently current, compare the data on both industrial and occupational employment with more recent sources of data on employment, such as the ES-202, BLS790, the OES Survey, and the CPS, to identify changes between the projections base-year and the most recent year available from these supplemental sources.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the most recent source of projected long-term demand data available and base-year.	Review Data Source Coverage Table 4.3.2 and inventory State programs using the State Data Source Analysis summary described in Chapter 2.
2. Identify which supplemental sources of data on industrial and occupational employment are available and the most recent year which they currently cover.	Possible sources include the ES-202, BLS790, and the CPS.
3. If the latest year covered by the supplemental sources of data on industrial and occupational employment is more recent than the base-year used for the projections, compare both the industrial employment figures and the occupational employment figures to determine: . Whether the relative employment size ranking for industries and occupations has changed since the base-year, and to what extent	Depending on the supplementary sources used, the following limitations apply: (1) Comparison will be limited to industry employment levels and therefore should focus on industries important to a given area and/or occupation (ES-202, BLS790) (2) Occupational employment data will be only available for some industries (OES Survey) (3) Very limited occupational detail is available (CPS).

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
. Have the changes in industrial employment and occupational employment between the base-year covered by the supplemental sources been in the same direction and relative magnitude as the projections of annual net demand, or have they been different?	
4. Analyze the differences or changes indicated by the more recent data and the implications of these differences in terms of supply/demand analysis.	For differences in industrial employment two approaches can be used to convert this data to information on occupations. One is to apply the occupational staffing patterns to those industries for which differences are identified, in order to determine the impact on occupational employment, or to rerun the entire industry-occupation matrix using the more recent industrial employment figures. Either State-wide or appropriate SMSA level staffing patterns by appropriate SIC size class should be used. Caution: This analysis does not produce new projections of annual net demand but it does provide additional information that can be useful in interpreting supply/demand relationships using sources of projected long-term demand.

PROCEDURAL STEPS FOR PROBLEM RESOULTION

PROBLEM: 1. Employment projections methodologies may not account for changes in economic conditions arising after the base-year employment data were obtained and the projections were produced. How can the effects of such changes in industry employment levels, share, or distribution be taken into consideration when long-term demand data are used in developing a supply/demand product?

SOLUTION: b. For sources of projected long-term demand for which the base-year employment data is not considered sufficiently current, analyze the base-year occupational employment data for indications of relative rather than absolute levels of employment.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the most recent available source of projected long-term demand data.	Review Data Source Coverage Table 4.3.2 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Obtain the data on base-year occupational employment from this source.	
3. Calculate the percentage share of each occupation of the total employment.	
4. Use this percentage as part of a supply/demand analysis rather than relying exclusively on the actual figures provided for total occupational employment.	

4.3.3 CURRENT AND SHORT-TERM DEMAND

DATA SOURCE COVERAGE

The availability of sources of current and short-term demand data vary from State to State. Some of them, such as the pilot job vacancies and new hires surveys, are available only in a few States. Other data sources are produced by the Employment Service, some of which are available in each State. These sources from the Employment Service essentially provide a measure of those job vacancies which are listed with the Employment Service. Depending upon how long a vacancy remains unfilled, it could be counted in more than one reporting period. See Data Source Coverage Table 4.3.3 for a listing of sources of current and short-term demand data and an indication of the time period coverage of each source.

PROBLEM BACKGROUND

Users may request supply/demand analysis for a short time period in the near future in order to plan for programs which could be started quickly and producing trained entrants to the labor market for specific occupations within a relatively brief period. However, because of the time required to collect data and process reports, data on current and short-term demand may actually be out-of-date by the time it is available for analysis.

	Page Number
PROBLEM:	
1. Sources of current and short-term demand data may not be sufficiently recent or comprehensive enough for the purpose of developing a product to meet user needs for a short range supply/demand analysis. What techniques might be employed to permit reliable use of current and short-term demand data as an indicator of job opportunities expected in the near future?	
SOLUTIONS:	
a. Analyze projected long-term occupational demand data to identify a list of relatively high demand occupations. Compare this list with data on current and short-term demand to attempt to identify and validate occupations suitable to serve as training program objectives.	4.3-19

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Sources of current and short-term demand data may not be sufficiently recent or comprehensive enough for the purpose of developing a product to meet user needs for a short-range supply/demand analysis. What techniques might be employed to permit reliable use of current and short-term demand data as an indicator of job opportunities expected in the near future?

SOLUTION: a. Analyze projected long-term occupational demand data to identify a list of relatively high demand occupations. Compare this list with data on current and short-term demand to attempt to identify and validate occupations suitable to serve as training program objectives.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Review OES long-term demand data and identify "high demand occupations" using such criteria as: . Occupations for which the average annual openings are above a certain level . Occupations in which employment in the State is above a certain level . Occupations in which employment in the State represents at least a certain percentage of total employment in the State. . Occupational for which annual net demand due to growth represents a certain share of total annual net demand	

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
2. For the occupations that meet the established criteria, analyze the available current and short-term occupational demand information regarding specific current openings by occupation.	. The current and short-term occupational demand information will either reinforce or contradict the long-term information.
3. Prepare a list of occupations for which the current and short-term demand information reinforces the projections data and a separate list of occupations for which the current and short-term demand information contradicts the long-term demand information. These lists can be used as input to the occupational supply/demand analysis.	. The decision as to whether or not the current and short-term occupational demand information reinforces or contradicts the long-term occupational demand information is partially subjective. This decision must be based on the known occupational coverage of the sources of current and short-term demand data.

4.3.4 ENTRANTS FROM EDUCATION/TRAINING PROGRAMS

DATA SOURCE COVERAGE

Data Source Coverage Table 4.3.4 presents the time period coverage of 20 different sources of data on entrants from education/training programs. As can be seen, the time periods which these sources cover vary considerably. This is primarily due to the fact that a number of different types of institutions offer training programs and that these institutions have independent operating schedules. For example, many educational institutions will use a school year, which may vary among specific institutions, but which typically covers a nine-month period. CETA prime sponsors, on the other hand, report participant data quarterly within a fiscal year. In addition, some CETA programs may have an open-entry, open-exit system, which means that individual completions may occur throughout a given time period rather than at a specific point in time. Varying administrative routines and procedures may also result in data becoming available from different sources at different times. This means that the most recent data available from each source at a given time may not be consistent across sources. Projections of supply data are typically not available, although some systems may produce them for internal planning purposes.

PROBLEM BACKGROUND

The problem in time period coverage for data on entrants from education/training programs has two facets. One involves the lack of consistency among sources in the time periods covered. The other problem deals with the relationship of data on entrants from education/training programs, which cover past and current time periods, with the long-term demand projections that are of interest to program planners. The specific problems and solutions are presented below on the next page.

	Page Number
PROBLEM:	
1. The data available from different education/training program reporting systems represent time periods that are not necessarily consistent. How can data from different time periods be related for subsequent supply/demand analysis?	
SOLUTIONS:	
a. Include only source data from this subcomponent that covers the desired time period of analysis.	4.3-28
b. Include source data from this subcomponent that represents different time periods but are the most current data from each reporting system.	4.3-30
c. Estimate the supply for the desired time period from each education/training source by using trends in historical data.	4,3-31
PROBLEM:	
2. How can supply data be related to projected long-term demand?	
SOLUTIONS:	
a. Project education/training program supply using current enrollment data and applying historical trends of the share of enrollees who complete or leave with marketable skills, and the subsequent share of that group who become part of available supply within a given time.	4.3-32
b. Project available supply from education/training programs based on recent historical trends in program growth.	4.3-34
c. Use current data on available supply from education/training programs without adjustment, to represent future supply levels in the absence of active intervention.	4.3-35

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. The data available from different education/training program reporting systems represent time periods that are not necessarily consistent. How can data from different time periods be related for subsequent supply/demand analysis?

SOLUTION: a. Include only source data in this subcomponent that covers the desired time period of analysis.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Define the time period for which education/training program data will be aggregated. Examples include: . School Year . Calendar Year . Calendar Quarter	
2. Determine, by charting data, when data from each system will be obtainable and what time period that information will cover.	See Exhibit 4.3.4-1 for a sample of such a table.
3. Develop a schedule for obtaining information for this supply subcomponent.	Schedule should permit sufficient time for processing and analysis of information once received.
4. Based on the constraints represented by the schedule, determine which reporting systems can provide information for the defined time period from Step 1.	May result in only one source of data.

EXHIBIT 4.3.4-1

SAMPLE OF A TABLE TO CHART
THE TIME PERIODS OF
DIFFERENT REPORTING SYSTEMS

REPORTING SYSTEM	ENROLLMENT INFORMATION		COMPLETER/LEAVER INFORMATION		FOLLOW-UP INFORMATION	
	Date of Information Availability	Time Period Coverage of Information	Date of Information Availability	Time Period Coverage of Information	Date of Information Availability	Time Period Coverage of Information
. VOC Ed (VEDS)						
. Higher Ed (HEGIS)						
. Priv Sch (NCES)						
. CETA MIS						
- Prime #1						
- Prime #2						
- Prime #3						
. Apprenticeship (SNAPS)						
. Voc Rehab MIS						
. State Education MIS						
. WIN						
. Job Corps						

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. The data available from different education/training program reporting systems represent time periods that are not necessarily consistent. How can data from different time periods be related for subsequent supply/demand analysis?

SOLUTION: b. Include source data from this subcomponent that represents different time periods but are the most current data from each reporting system.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the time periods covered and date of information availability for each reporting system.	Review Data Source Coverage Table 4.3.4 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2. See also Exhibit 4.3.4-1
2. Select comparable measures of available supply from each source.	See discussion in Section 4.4.4.
3. Include data in the supply/demand interface on available supply from different sources using the most current data from each source.	
4. In publications and presentations of occupational supply, carefully describe time periods covered by each source (e.g., different dates can be noted in column headings or footnotes).	Footnotes and other qualifiers may not be considered by data users.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. The data available from different educational/training program reporting systems represent time periods that are not necessarily consistent. How can data from different time periods be related for subsequent supply/demand analysis?

SOLUTION: c. Estimate the supply for the desired time period from each education/training source by using trends in historical data.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify time periods covered and date of information availability for each reporting system.	Review Data Source Coverage Table 4.3.4 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2. See also Exhibit 4.3.4-1
2. Identify reporting systems that do not contain data for the desired time period.	
3. Review historical data for those reporting systems identified in Step 2.	
4. Estimate the desired time period for these sectors by extrapolating recent historical trends.	Dynamic factors such as population, employment, and relevant legislation should be considered to ensure the relevance of historical data to the current situation.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 2. How can supply data be related to projected long-term demand?

SOLUTION: a. Project education/training program supply using current enrollment data and applying historical trends on the share of enrollees who complete or leave with marketable skills, and the subsequent share of that group who become part of available supply within a given time.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the level of current enrollments for each education/training program for which supply projections are to be developed.	
2. Identify the time length of each program from initial enrollment to normal completion.	
3. Identify the length of time covered by the enrollment figure for each program.	Since current enrollments can be reliably projected to the point at which enrollees are expected to complete and become available for labor force entry, it is important to know for longer-term programs (i.e., two to three years) whether the enrollments figure is aggregated (i.e., enrollments from each year of the program are included in the current enrollments figure) or disaggregated (i.e., enrollments in multi-year programs are broken out in some way (whether by grade level, class standing or first year, second year, etc.).
4. Examine data from previous years on each program's enrollments, completions and follow-up, in order to determine the percentage or share of enrollees who become part of available supply within a given time period (e.g. each year).	

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PROCEDURAL STEPS	COMMENTS/LIMITATIONS
5. Apply this percentage to the current enrollments figure to project available supply from each program.	The date to which supply can be projected will depend on the length of the program; the longer the program, the farther ahead the supply can be projected from current enrollments. For example, enrollees entering a one-year program can be projected to the end of that year. For a three-year program, enrollees entering the 1st year can be projected three years ahead; those entering the 2nd year can be projected two years ahead; during the final year, enrollees can be projected one year ahead. Thus, three years of projected available supply could be obtained. A limitation of this procedure is that restricting the base to current enrollments means that short-term programs cannot be projected very far.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 2. How can supply data be related to projected long-term demand?

SOLUTION: b. Project available supply from education/training programs based on recent historical trends in program growth.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the units of measure of available supply to be used from each education/training program data source.	Review Data Source Coverage Table 4.3.4 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Identify the average rate of growth or decline in available supply from each program over recent years.	
3. Apply this rate of change to the current available supply data using a straight-line time trend to obtain future (projected) supply for the desired year.	The limitation of this procedure is that past trends may not hold true for the future due to factors not taken into account in this method. Furthermore, future trends may be affected by direct intervention on the part of program planners and administrators.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 2. How can supply data be related to projected long-term demand?

SOLUTION: c. Use durrent data on available supply from education/training programs, without adjustment, to represent future supply levels in the absence of active intervention.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the units of measure of available supply to be used from each education/training data source.	Use the State Data Source Analysis Summary described in Chapter 2.
2. Use these measures of available supply in the supply/demand interface.	Where there is little discernable evidence of significant trends in either program growth or decline this method has the advantage of approximating what future supply levels would be in the absence of change to the program by planners and administrators. This permits planners to examine all the alternative strategies for responding to future supply/demand levels without building in a set of structured assumptions that might set one of the variables which in fact is open to manipulation.

4.3.5 JOBSEEKERS

DATA SOURCE COVERAGE

Table 4.3.5 presents the time period coverage of data sources on jobseekers. The sources may cover calendar years (as in the CPS), fiscal years (as in Employment Service Applicants data), or other time periods as requested (as in military discharges data). Data are collected from these sources on a daily, monthly, or quarterly basis.

PROBLEM BACKGROUND

As with the entrants from education/training subcomponent, data sources on jobseekers may vary in the time period coverage.

	Page Number
PROBLEM:	
1. Data on jobseekers from different sources may become available at different times and may cover varying dates. How can data from different supply sources be related for subsequent supply/demand analysis?	
SOLUTIONS:	
a. Select and combine different sources of data on jobseekers that cover the same time period as that selected for the supply/demand analysis.	4.3-38
b. Use multiple sources of data on jobseekers which represent supply available within different dates, but which do represent the most recent data available from each source to be included in the supply/demand interface.	4.3-39

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Data on jobseekers from different sources may become available at different times and may cover varying dates. How can data from different supply sources be related for subsequent supply/demand analysis?

SOLUTION: a. Select and combine different sources of data on jobseekers that cover the same time period as that selected for the supply/demand analysis.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the measure of available supply to be used from each source of data on jobseekers.	Review Data Source Coverage Table 4.3.5 and inventory State programs using the State Data Source Analysis Summary described in Chapter 2.
2. Identify when data from each source will be available and the dates and length of the time period covered.	
3. Develop a schedule for obtaining data reports from these sources	Schedule should permit sufficient time for processing and analyzing the data once received.
4. Determine which of the reports that are available in a timely fashion (according to the schedule developed in Step 4) cover persons seeking jobs during the time period desired for the supply/demand interface.	
5. Obtain the desired data from each available report and include these or combine them in the final supply/demand product.	

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Souces of data on jobseekers may become available at different times and may cover varying dates. How can data from different supply sources be related for subsequent supply/demand analysis?

SOLUTION: b. Use multiple sources of data on jobseekers which represent supply available within different dates, but which do represent the most recent data available from each source to be included in the supply/demand interface.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the dates of the time period covered by the most reecent data available from each source of data on jobseekers.	Review Data Source Coverage Table 4.3.5 and inventory State programs using the State Date Source Analysis Summary described in Chapter 2.
2. Include data from each source in supply/demand analysis, carefully labeling the supply data so that they clearly indicate the variation in dates.	Limitation: Users of the supply/demand product may not notice the distinction and may not take into account the implications of this variation.

4.3.6 SUPPLY/DEMAND INTERFACE

DATA SOURCE COVERAGE

As discussed in the introduction to this overall section on time period coverage issues, the coverage of occupational demand data may determine the time period that can be used for the actual supply/demand interface. The use of long-term demand data will produce a supply/demand interface that is suitable for a number of long-range planning and management uses. A supply/demand interface based on current/short-term demand data will have different applications such as a proxy indicator of longer term supply/demand analysis, for the planning of short-run education/training programs or for career guidance and job placement uses.

PROBLEM BACKGROUND

Users may need a supply/demand analysis for a variety of purposes. These needs might best be met be developing supply/demand interfaces that cover different time periods.

	Page Number
PROBLEM: 1. How can a supply/demand interface be developed to cover time periods appropriate to meet user needs?	
SOLUTION: a. Develop either a long-term or a short-term supply/demand interface, or develop both and use the short-term product as a proxy to interpret and refine the analysis of the long-term data. These three options are feasible given most existing data sources and should serve to fill users' needs with regard to time period coverage.	4.3-41

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. How can a supply/demand interface be developed to cover time periods appropriate to meet user needs?

SOLUTION: a. Develop either a long-term or a short-term supply/demand interface or develop both and use the short-term product as a proxy to interpret and refine the analysis of the long-term data. These three options are feasible given most existing data sources and should serve to fill users' needs with regard to time period coverage.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Determine which of the following time periods best meet user needs for a supply/demand interface: . A long-term supply/demand interface . A short-term supply/demand interface . Both a long-term and a short-term supply/demand interface, the latter to be used as a proxy to analyze, interpret and refine the analysis of the former.	
2. Identify which source(s) of demand data can be used to develop a supply/demand interface for the time period selected in Step 1.	See Data Source Coverage Tables 4.3.2 and 4.3.3.

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
3. Determine the unit of time used in the source(s) of demand data selected in Step 2 (e.g., annual, monthly) and the dates covered by the most current available data.	Use the State Data Source Analysis Summary described in Chapter 2. Example: Use annual average openings data from sources of long-term projected demand and develop a long-term supply/demand interface to cover a year period.
4. Identify which sources of supply data can be matched to the time period dimensions of the selected source(s) of demand data.	See Data Source Coverage Tables 4.3.4 and 4.3.5.
5. Identify and implement any procedures needed to match sources of supply or demand data to the designated time period.	See Problems and Solutions in Section 4.3.2, 4.3.3, 4.3.4, and 4.3.5. Section 4.3.3 includes suggested procedures for a supplementary analysis of current/short-term demand data to be used as a proxy to assist in interpreting and analyzing a longer-term supply/demand interface.
6. Use the resulting data from the selected sources to construct and/or analyze a supply/demand interface.	

4.4 MEASUREMENT ISSUES
4.4.1 INTRODUCTION

BACKGROUND

A multiplicity of data sources is used to form the basis of an OIS. A number of these can be used to develop various types of supply/demand interfaces. These data sources were created by different agencies and institutions for their own purposes and use, and were not necessarily designed to fit into the conceptual elements of an OIS. As a result, several measurement problems arise in the incorporation of these data sources as components in a supply/demand interface. The three major issues are:

- How well does the measure provided by the data source serve as a measure of the conceptual component of either occupational supply or occupational demand, (i.e., how well does it match the concept?).
- How completely does the data source cover the component for which it is being used as a measure? For example, are there gaps in coverage that result from using ES job listings as a measure of openings?
- Do any of the data sources duplicate, in part or in whole, other sources? That is, does double-counting occur, for example, where an individual enrolled in an education/training program might be counted in two different reporting systems?

USER NEEDS

Users may not always be aware of the potential measurement problems described above. These problems, however, can affect the reliability of the supply/demand relationship and the degree of confidence with which a supply/demand product can be interpreted and applied in planning or management decisions. For these reasons, measurement problems do affect users and should be of concern to them, particularly in assessing how much weight to put on a supply/demand analysis in making a decision and how to interpret it in relation to other factors under consideration.

MEASUREMENT DIMENSIONS

This section discusses measurement problems in preparing a supply/demand analysis. To assist in this discussion, major data sources are assessed in terms of:

- Extent of or gaps in coverage
- Duplication of coverage

This assessment is presented on the Data Source Coverage Tables that are a part of each OIS subcomponent discussion in this section. Exhibit 4.4.1-1 provides a sample of the format used in these tables.

STRUCTURE OF SECTION 4.4

Measurement issues are described as they apply to each OIS subcomponent. They are presented in the following subsections on the indicated pages:

Subsection Number	Subsection Title	Pages
4.4.2	Long-term Demand	4.4-4
4.4.3	Current and Short-Term Demand	4.4-7
4.4.4	Entrants from Education/Training Programs	4.4-12
4.4.5	Jobseekers	4.4-38

The following topics are addressed within each subsection:

- Data Source Coverage
- Problem Background
- Problem(s)
- Solutions
- Procedural Steps for Problem Resolution

4.4.2 LONG-TERM DEMAND

DATA SOURCE COVERAGE

The projections of long-term industrial and occupational employment demand are perhaps the only subcomponent of an OIS that has a design and structure that corresponds closely to the theory and concept of occupational demand for which it is used as a measure. Since the projections programs were designed to measure and estimate occupational demand, rather than to serve as an internal management system, their use as long-term demand data sources presents relatively few measurement problems. Data Source Coverage Table 4.4.2 summarizes the major measurement issues in relation to the sources of long-term demand data.

Some gaps in coverage occur in the OES program because of the difficulty of surveying certain sectors The following employment sectors are not covered by the OES Survey or Survey-based matrix:

- Agriculture, forestry, and fishing industries
- Self-employed individuals
- Private household workers
- Unpaid family workers

Neither the OES Survey or Census cover the military. Census coverage is broader than that of the OES because it is a household-based survey rather than an establishment survey; however, this makes it more susceptible to response bias. Some supplements are available to fill the gaps in coverage of industry sectors and class of workers in the OES program, and research is being conducted at the national level and in various States to cover some of the sectors that are not currently included. In any State where both programs are available, OIS producers should use only the one that offers the greatest coverage and most detail.

4.4.3 CURRENT AND SHORT-TERM DEMAND

DATA SOURCE COVERAGE

Several of the major sources of current and short-term demand data that measure job vacancies are or may be appropriate measures of current net demand. The major measurement problem associated with these sources is gaps in coverage. Most States have only one source of data on job vacancies available to them, the data available from the Employment Service (ES). This source, however, only provides data on those job openings listed with the ES, which may be a relatively small share of total job vacancies. Instituting a job vacancy or new hires survey, as has already been done or is being tried on an experimental basis in some States, is probably the only way to deal with this coverage problem. Because only six States currently have an ongoing system for collecting job vacancy or new hires data, the problem of duplication in the remaining States should not exist. In those cases where more than one source is available, the best resolution would be to use the source that has the best coverage. Other sources of data on current employment have measurement issues similar to those of the sources of long-term employment demand. Data Source Coverage Table 4.4.3 indicates the measurement issues that pertain to the sources of data on both current and short-term demand.

DATA SOURCE COVERAGE TABLE 4.4.3

Page 1 of 4
Page 4.4-5

Volume 1 Sections-- 2.1.1
2.1.2
2.2.2
3.1.1

OIS Subcomponent
Current and Short-Term Demand

Measurement Issues

Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Occupational Employment Statistics Programs: Survey (2.1.1.A)	.The OES Survey excludes the agriculture, forestry, and fishing industries, as well as private households, self-employed persons, and unpaid family workers. . Not all States participate in the OES Survey.	. The OES Survey and the Census both collect information on employment by occupation for the U.S. population. The OES Survey collects the employment information from establishments while the Census collects the employment information from households.	
Census of Population (2.1.1.B)		. The Census and OES Survey both collect information on employment by occupation for the U.S. population (see above). The Census collects such information from households while the OES Survey collects such information from establishments.	
Occupational Employment Statistics Program: Industry-Occupation Matrix (2.1.1.C)			

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DATA SOURCE COVERAGE TABLE 4.4.3

Volume 1 Sections--2.1.1
2.1.2
2.2.2
3.1.1

OIS Subcomponent--
Current and Short-Term Demand

Programs/Data Sources	Measurement Issues Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
. OES Survey-based matrix	. An OES Survey-based matrix covers all industry sectors except for agriculture, forestry, fishing, and private households. . The OES Survey-based matrix covers only wage and salary employment and hence excludes both the self-employed and unpaid family workers. . Not all States have an OES Survey-based matrix.	. The OES Survey-based matrix covers most of the same population as the Census-based matrix.	. The OES Survey-based matrix requires three consecutive years of OES Survey data to generate an I-O matrix.
. Census-based matrix	. The Census-based matrix covers all industry sectors and all classes of workers, including self-employed and unpaid family workers. . All States can have a Census-based matrix.	. The Census-based matrix covers at least the same population as the OES Survey-based matrix except that multiple job holders are counted only once in the Census-based matrix.	
Current Population Survey (2.1.1.D)		. Employment and unemployment information are duplicated by other sources of information that generally provide more classification detail.	

Volume 1 Sections--2.1.1
2.1.2
2.2.2
3.1.1

OIS Subcomponent--
Current and Short-Term Demand

Measurement Issues

Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Cooperative Health Statistics System (2.1.1.E)	. Data are collected on a limited number of health professions.	. Data collected as part of this program would also be collected through the Census, the OES program, and by various professional associations.	
Estimating Employment Opportunities in Agribusiness (2.1.1.F)		. The employment opportunities represented in this publication are derived from the Census-based industry-occupation matrix.	
Hired Farm Working Force Survey (2.1.1.G)	. This survey covers only hired farm workers.		
Employment Service Operations (2.1.2.A)	. Job orders filed with the Employment Service represent a relatively small share of the total job openings.	. Job openings reported by various job vacancy or job openings studies/surveys may duplicate the job orders filed by employers with the Employment Service.	
BLS Pilot Job Vacancy Study (2.1.2.B)	. This is a pilot test program and only exists in four States.	. Vacancies reported through this survey duplicate at least some of the job orders reported to the Employment Service.	

Volume 1 Sections--2.1.1
2.1.2
2.2.2
3.1.1

OIS Subcomponent

Current and Short-Term Demand

Measurement Issues

Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Minnesota's Occupational New Hires and Job Openings Survey (2.1.2.C)	. Minnesota is the only State collecting and publishing new hires and job openings data on an ongoing basis.	. The job openings reported on the quarterly data collection forms duplicate at least some of the job orders reported to to the Employment Service.	
Utah Occupational Hires Data (2.1.2.D)	. These data are collected on an ongoing basis in Utah only. The data were only tabulated and published for the initial research project in 1976.	. The new hires reported on the data collection form duplicate at least some of the job orders reported to the Employment Service.	. New hires information is a measure of the job vacancies that existed in the labor market recently.
Employer Needs Survey (2.2.2.A)	. The content, quality, and coverage of individual employer needs surveys vary widely.	. Information collected as part of employer needs surveys may be and frequently is available through the OES program.	. Results of employer needs surveys should be carefully analyzed to determine why a particular survey was undertaken and what the strengths and weaknesses of each survey are.

4.4.4 ENTRANTS FROM EDUCATION/TRAINING PROGRAMS

DATA SOURCE COVERAGE

Volume 1 described 20 different sources of information on entrants from education/training programs, These sources represent separately financed and administered training activities, The collection, organization, measurement concepts, and presentation of data from these sources were designed largely to meet the internal administrative needs of each program. The diversity of sources in this subcomponent results in more problems involving measurement issues than in any other OIS subcomponent. Data Source Coverage Table 4.4.4 (starting on page 4.4-17) assesses each data source in terms of its coverage.

PROBLEM BACKGROUND

The term "entrants from education/training programs," implies a specific subset of program participants. "Entrants" means labor force entrants; the actual available supply from education/training programs includes only those qualified program participants who obtain or seek employment in occupations related to their training. Persons who pursue further education after completing a program or who for other reasons do not participate in the labor force are not part of actual available supply.

Data on education/training program participants can be provided in three major categories: enrollments, completions, and follow-up data. Data will not be available in all of these categories from each data source. Therefore, information (typically through follow-up surveys) is needed to determine the proportions of enrollees, completers, or qualified leavers, that actually become part of available supply. Ways of obtaining a measure of available supply are discussed under Problem 1, Solutions a and b.

Given the number of different data sources on entrants from education/training programs, the problem in this area is less one of gaps in coverage than of overlaps and duplication in coverage. However, gaps may occur in a few areas. Some training programs are not conducted by traditional educational institutions or employment and training agencies. For example, employers may offer training either on-the-job or in a specialized setting. Community-based organizations (CBOs) also provide job training for individuals. A significant portion of persons trained by CBOs may be CETA participants, but not necessarily all of them. Finally, the VEDS reports cover only those programs in public vocational education

PROBLEM BACKGROUND (Continued)

that must be included in the State Plan. This means that public vocational programs that are funded solely by State funds and that do not use Federal monies under Public Law 94-482 might not be reported and covered through VEDS.

Data on entrants from education/training programs may be reported by two types of agencies:

- Agencies that provide the fiscal resources for the programs (funding agencies)
- Agencies that operate the education/training programs (operating agencies)

In the cases where the same agency serves in both the funding and operating role, there is no duplication problem. An example of this is a CETA prime sponsor that conducts training in its own facility for its clients. If, however, the CETA prime sponsor contracted with a community college to operate a vocational training program for its clients, data on those clients may be reported by both the funding agency (in CETA program data) and by the operating agency (perhaps in both the HEGIS reports and the VEDS reports). Such overlaps might occur in numerous other cases, resulting in duplicate counts of individuals, as outlined in Exhibit 4.4.4-1. This duplication occurs because different providers of education/training programs may receive funding from multiple sources, either directly or by serving individuals who may be the responsibility of another agency. The cause of the overlaps listed in Exhibit 4.4.4-1 are detailed in the "Duplication of Coverage" column in Data Source Coverage Table 4.4.4.

The right-hand side of Exhibit 4.4.4-1 indicates if the program data source uses an institution or individual-based reporting system. This consideration is an important one in trying to solve problems of duplication. It is described further in the following problem/solution discussions.

Program/Data Source	Program/Data Sources With Which Coverage May Overlap	Type of Reporting System	
		Institution-Based	Individual-Based
1. Voc Ed (VEDS)	2, 3, 4, 5, 6, 7, 8	X	X
2. Higher Ed (HEGIS)	1, 4, 5, 6, 8	X	
3. Priv Sch (NCES)	1, 4, 5, 6, 8	X	
4. CETA MIS	1, 2, 3, 5, 9		X
5. Appr (SNAPS)	1, 2, 3, 4	X	X
6. Voc Rehab MIS	1, 2, 3		X
7. State Ed MIS	1	X	X
8. WIN	1, 2, 3		X
9. Job Corps	4	X	X

Definitions:

Individual-Based Reporting System--This reporting system is based on the individual served and tracks the nature of the services received, including the code of the occupation for which an individual was trained.

Institution/Program-Based Reporting System--This reporting system groups program-level information (e.g., number of courses and course enrollment) for each participating institution (e.g., VEDS: local school district, HEGIS: a public four-year college) by a State program code (e.g., VEDS: USOE Code, HEGIS: HEGIS code).

Note: Depending on data processing capability and administrative approach, a given supply source may operate in a particular State using both types of reporting systems.

	Page Number
PROBLEM:	
1. Data sources for entrants from education/training programs contain several different units of measure of available supply, including enrollments, completions, and graduate status. How can these data be most appropriately used in supply/demand analysis?	
SOLUTIONS:	
a. Identify the units of measure available from each source of data on education/training programs. Use the units of measure that are common to all sources and most closely approximate the concept of available supply.	4.4-29
b. Identify the units of measure available from each source of data on education/training programs. Use the units of measure for each source that most closely approximates the concept of available supply even if it is not common to all sources.	4.4-33

	Page Number
PROBLEM:	
2. Combining data on entrants from different education/training programs may result in an overcount of supply because the individual could be counted by more than one agency. This duplication may occur between or among reporting systems that are individual-based (e.g., Rehabilitation MIS) or those that are institution/program-based (e.g., HEGIS). What methods can be used to identify and eliminate this duplication so that supply counts are not overstated?	
SOLUTIONS:	
a. To eliminate duplication between individual-based reporting systems, compare the data from two sources at a time, match individual records to identify the nature of the overlap, and establish rules for counting each individual in only one source.	4.4-34
b. To eliminate duplication between individual-based reporting systems and institution-based reporting systems, compare data from two sources at a time, identify the nature of the overlap and establish rules for avoiding duplication.	4.4-36
c. To eliminate duplication between institution-based reporting systems, compare data from two sources at a time, identify the nature of the overlap, and establish rules for avoiding duplication.	4.4-37

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OIS Subcomponent--
Entrants from Education/ Training Programs

DATA SOURCE COVERAGE TABLE 4.4.4

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Page 4.4-14

Programs/Data Sources	Measurement Issues Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Vocational Education Data System (VEDS) (3.2.1.A)	VEDS only reports on vocational education programs included in a State's Annual Plan for Vocational Education.	Information collected through VEDS may also be collected as part of other reporting systems or survey programs such as: . HEGIS in the community and junior colleges . NCES Postsecondary Career School Survey for certain institutions . CETA MIS for participants receiving training through the vocational education system . SNAPS for apprentices receiving classroom training through the vocational education system . Vocational Rehabilitation MIS for clients receiving training through the vocational education system . State Education MIS, which would cover all education programs in a State	Possible measures of occupational supply include enrollments, completers and leavers, or follow-up information.

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OIS Subcomponent--
Entrants from Education/
Training Programs

Measurement Issues

Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Vocational Education Data System (VEDS) (3.2.1.A) (continued)		. WIN for clients receiving skills training through the vocational education system	
VEDS Follow-up Component (3.2.2.A)	. VEDS follow-up reporting only covers former vocational education students from vocational education programs included in a State's Annual Plan for Vocational Education. . The SOC occupational field of placement is reported only for completers who are employed and not reported for leavers who are employed . Follow-up information may be based on a sample of completers and leavers rather than the universe.	. Information collected through the VEDS follow-up component may also be collected as part of other follow-up data-collection efforts, such as: - Local CETA prime sponsor follow-up surveys, which may sample former participants who received training through the vocational education system - Vocational Rehabilitation (VR) MIS follow-up efforts, which may survey former VR clients who received training through the vocational education students - Education MIS follow-up surveys which will also sample former vocational education students	Follow-up information from VEDS can be used as a measure of occupational supply.

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Entrants from Education/
Training Programs

DATA SOURCE COVERAGE TABLE 4.4.4

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Programs/Data Sources	Measurement Issues Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
VEDS Follow-up Component (3.2.2.A) (continued)		- Veterans Administration Occupational Graduate Employment Report, which may cover persons who received training through the vocational education system	
Higher Education General Information Survey (HEGIS) (3.2.1.B)	. Information about higher education enrollments and degrees conferred is reported by higher education institutions receiving Federal assistance. . Survey forms are completed for each physical campus of each accredited institution of higher education. . Enrollments are only reported for major field of study (broad academic discipline) rather than specific degree discipline specialty.	. Information collected through HEGIS may also be collected as part of other reporting systems or survey programs, such as: - VEDS in the community and junior colleges - CETA MIS for participants receiving training through the community college system - SNAPS for apprentices receiving classroom training through the community college system - Vocational Rehabilitation MIS for clients receiving training through the community college system	Possible measures of occupational supply include enrollments and degrees conferred (graduates or completers).

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DATA SOURCE COVERAGE TABLE 4.4.4

Programs/Data Sources	Measurement Issues		
	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Higher Education General Information Survey (HEGIS) (3.2.1.B) (continued)		- WIN for clients receiving skills training through the community college system	
Survey of Recent College Graduates (3.2.2.B)	. The sample for this survey focuses on graduates trained for and seeking teaching positions.		
NCES Postsecondary Career School Survey (3.2.1.C)	. This survey covers public and private noncollegiate postsecondary schools offering one or more occupational programs intended to prepare individuals for specified careers. . This survey covers the broadest range of private and proprietary schools of any existing data collection efforts, but all schools in this universe may not necessarily respond to the survey, thus reducing the survey coverage	. Information collected through this NCES survey may also be collected as part of other reporting systems or survey programs, such as: - VEDS for certain institutions - CETA MIS for participants receiving training through postsecondary career schools - SNAPS for apprentices receiving classroom training through postsecondary career schools - Vocational Rehabilitation MIS for clients receiving	. Possible measures of occupational supply include enrollments and completions.

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DATA SOURCE COVERAGE TABLE 4.4.4

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Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
NCES Postsecondary Career School Survey (3.2.1.C) (continued)		training through postsecondary career schools - WIN for clients receiving skills training through postsecondary career schools	
Comprehensive Employment and Training Act (CETA) Management nformation System (3.2.1.D)	. This MIS reporting covers clients/participants receiving employment and/or skills training preparation through CETA funding.	. Information collected and reported through the CETA MIS may also be collected as part of other reporting systems or survey programs such as: - VEDS, for CETA participants being provided training through the vocational education system - HEGIS, if skills training is conducted through a community or junior college - NCES Postsecondary School Survey, if the CETA participant receives training through one of the surveyed institutions	. Possible measure of occupational supply includes enrollments and completions. . Reporting systems used by CETA prime sponsors within a State may not be compatible.

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Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Comprehensive Employment and Training Act (CETA) Management Information System (3.2.1.D) (continued)		- SNAPS, if apprentices receive classroom training in CETA skills centers - Job Corps, if skills training is provided through a Job Corps Center	
Continuous Longitudinal Manpower Survey (CLMS) (3.2.2.C)	. This CETA impact evaluation survey covers a national sample of program participants.	. Information collected and reported through the CLMS may also be collected as part of other follow-up data collection efforts, such as: - VEDS follow-up component, which might cover CETA participants who received training through the vocational education system - Local CETA prime sponsor follow-up surveys, which cover the same universe of participants	. Follow-up information from CLMS can be used as a measure of occupational supply (but only on a national basis).
CETA Local Prime Sponsor Follow-up (3.2.2.D)	. Individual prime sponsors may or may not conduct follow-up surveys of former CETA clients/participants who received employment and/or skills training preparation under CETA.	. Information collected through these CETA prime sponsor follow-up surveys may also be collected as part of other follow-up data collection efforts such as:	. Follow-up information from CETA local prime sponsor follow-up surveys can be used as a measure of occupational supply.

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Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
CETA Local Prime Sponsor Follow-up (3.2.2.D) (continued)		- VEDS follow-up component, which might cover CETA participants who received training through the vocational education system - CLMS, which covers the same universe of participants - Veterans Administration Occupational Graduate Employment Report, which may cover graduates of a program that receive CETA funding	
State and National Apprenticeship System (SNAPS) (3.2.1.E)	. This reporting system covers apprentices receiving training in registered apprenticeship programs. Registered apprenticeship programs do not cover all apprenticeship programs.	. Information collected through SNAPS may also be collected as part of other reporting systems or survey programs, such as: - VEDS, if apprentices receive classroom training through the vocational education system - HEGIS, if apprentices receive classroom training through the community or junior college system	. By definition, apprentices are currently employed and will, therefore, be counted in the current occupational demand data. They should, however, be considered when decisions are being made about education/training program offerings.

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Entrants from Education/
Training Programs

Programs/Data Sources	Measurement Issues: Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
State and National Apprenticeship System (SNAPS) (3.2.1.E) (continued)		- NCES Postsecondary Career School Survey, if apprentices receive classroom training through one of the surveyed schools - CETA MIS, if apprentices receive classroom training from a CETA skills center	
Vocational Rehabilitation Management Information System (3.2.1.F)	. This reporting system covers handicapped individuals receiving vocational rehabilitation services through a State's vocational rehabilitation program.	. Information collected through the Vocational Rehabilitation (VR) MIS may also be collected as part of other reporting systems or survey programs, such as: - VEDS, if VR clients receive skills training through a community or junior college - HEGIS, if VR clients receive skills training through a community or junior college - NCES Postsecondary Career School Survey, if VR clients receive training through a surveyed institution	. Possible measures of occupational supply include enrollments, terminations, and placements.

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DATA SOURCE COVERAGE TABLE 4.4.4

Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Vocational Rehabilitation Follow-up Surveys (3.2.2.E)	. Clients who have formerly received vocational rehabilitation client services are covered by an evaluation follow-up survey.	. Clients surveyed as part of the follow-up evaluation study would have also been tracked through placement in the Vocational Rehabilitation MIS.	. Follow-up information from these surveys can be used as a measure of occupational supply.
State Education Management Information System (3.2.1.G)	. These systems generally cover education programs in public education for kindergarten through 12th grade (K-12) enrollments, completions, and drop-outs (leavers).	. Part of the information collected through the State Education MIS will also be collected through VEDS. [illegible] however, will only [illegible] tional education [illegible] which are covere[illegible] Annual Plan fo[illegible] Education.	. Possible measures of occupational supply include enrollments, completions, and drop-outs.
Education Management Informational System Follow-up Surveys (3.2.2.F)	. These surveys generally cover high school graduates and drop-outs from secondary public education institutions.	. Information [illegible] these follow[illegible] also be colle[illegible] vocational st[illegible] the VEDS follow[illegible]	[illegible] from [illegible]
Work Incentive (WIN) Program (3.2.1.H)	. All recipients of Aid to Families with Dependent Children (AFDC) are required to register with the WIN program unless they are legally exempt.	. Information colle[illegible] the WIN program may [illegible] collected as part of other reporting systems or survey programs such as:	[illegible] supply include [illegible] enrollments, terminations, and placements.

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Entrants from Education/
Training Programs

Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Work Incentive (WIN) Program (3.2.1.H)	. Certain WIN clients receive skills training through various providers of training services.	- VEDS, if WIN clients receive skills training through the vocational education system - HEGIS, if WIN clients receive skills training through the community or junior college system - NCES Postsecondary Career School Survey, if WIN clients receive skills training through a surveyed institution	
Job Corps (3.2.1.I)	. Job Corps Centers provide vocational skills training to disadvantaged youth and young adults (16 to 22) who are out of work or school and who need additional skills to secure and hold productive jobs.	. Information reported through the Job Corps program may also be reported through the CETA MIS if a CETA clients has been referred to the Job Corps.	. Possible measures of occupational supply include enrollments and terminations.
ob Corps Placement 3.2.1.I)	. All former Job Corpsmembers are reported through the Job Corps Placement System.	. Any Job Corpsmembers who were tracked in the CETA MIS may be followed-up through CETA local prime sponsor follow-up surveys as well as through the Job Corps Placement system.	. Placement information can be used as a measure of occupational supply.

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Entrants from Education/
Training Programs

Measurement Issues

Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Veterans Administration Occupational Graduate Employment Report (3.2.2.G)	. This report is the result of a survey conducted by institutions that are seeking approval of a vocational program for VA benefits. . Surveys by individual institutions must cover both veterans and non-veterans.	. Information collected through these follow-up surveys may also be collected as part of other follow-up data collection efforts, such as: - VEDS follow-up component, which may cover students from an institution seeking approval for a vocational program for VA benefits - CETA local prime sponsor follow-ups, which may have clients who received training from an institution seeking approval for a vocational program for VA benefits	. Follow-up information through the individual institution surveys can be used as a measure of occupational supply.
Federal Trade Commission Regulations for Proprietary Vocational and Home Study Schools (3.2.2.H)	. If these FTC regulations were operational, information regarding enrollments, completions, and placements from proprietary schools would be systematically available for inclusion in an OIS. However, these regulations are not currently operational.		. These FTC regulations are not operational yet and hence there is no existing information under these regulations.

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Training Programs

Measurement Issues

DATA SOURCE COVERAGE TABLE 4.4.4

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Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
National Longitudinal Study/ Surveys (3.2.2.I)	. These studies/surveys cover different cohort groups that are tracked on a longitudinal basis over time.		. The information collected as part of these studies/ surveys cannot be systematically integrated into an OIS without further research.
Vocational Education Uniform Follow-up Reporting (3.2.2.J)	. These reporting guidelines establish common data elements to be collected across various follow-up data collection efforts. This, itself, is not an operational data collection program.	. The purpose of these guidelines is to reduce differences across various follow-up data collection efforts.	

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Data sources for entrants from education/training programs contain several different units of measure of available supply including enrollments, completions, and graduate status. How can these data be most appropriately used in supply/demand analysis?

SOLUTION: a. Identify the units of measure available from each souce of data on education/training programs. Use the units of measure that are common to all sources and most closely approximate the concept of available supply.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the units of measure available from each source of data on education/training programs.	See Exhibit 4.4.4-2 and Data Source Coverage Table 4.4.4
2. Identify the unit of measure from each source which best represents the concept of available supply.	See Exhibit 4.4.4-3
3. Identify which unit of measure serves as the best proxy of available supply and is common to all data sources.	
4. Include the unit of measure, identified in Step 3, in the supply/demand product and use that measure to add supply data from different sources and indicate total supply to an occupation from education/training programs.	

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
5. There are two alternative ways of making use of this data so that the greater detail provided can be taken into consideration in the supply/demand analysis:	It is possible that the common measure will not be the best measure of available supply that each data source provides.
. Design an appropriate format which includes an additional column or columns following the one giving the unit of measure, to provide the better measure(s) of available supply.	Either column headings or footnotes will be necessary to identify what that measure is and what source(s) it comes from.
OR	
. Attach a separate supply table which indicates the data on all measures of the status of program participants for each source.	

EXHIBIT 4.4.4-2
UNITS OF MEASURE OF
EDUCATION/TRAINING PROGRAMS
Page 4.4-28

	Units Of Measure		
Program/ Data Source Education/Training Program	Reported Program Enrollment	Program Completer or Leaver Data	Program Follow-Up Data
Vocational Education (VEDS)	X	X	X
Higher Education (HEGIS)	X	X	
NCES Postsecondary School School Study	X	X	
CETA MIS	X	X	X
Apprenticeships (SNAPS)	X	X	
Vocational Rehabilitation MIS	X	X	X
State Education MIS	X		X
Work Incentive (WIN) Program	X	X	
Job Corps	X	X	

EXHIBIT 4.4.4-3
PROXIES FOR
AVAILABLE SUPPLY

As presented in Volume I of this Handbook, available supply is defined as the number of persons who are qualified for employment in an occupation and who are currently either employed in the occupation or unemployed and seeking work in the occupation.

Several different units of measure for education/training programs can be related to the concept of available supply. These include enrollment, completer, leaver, and follow-up data. These units of measure can be used, either directly or with adjustment, as proxies for available supply for an occupation. They are listed below and ranked by the extent to which they conform with the definition of available supply.

RANK AS PROXY FOR AVAILABLE SUPPLY*	ALTERNATIVE UNITS OF MEASURE OF AVAILABLE SUPPLY
1	Program follow-up data reflecting the number of education/training program participants who acquired salable skills and have obtained or sought related employment
2	Program follow-up data reflecting the number of education/training program participants who acquired salable skills and have obtained or sought employment
3	Current program completion data adjusted by the historical rate of the share indicating intent to seek related employment
4	Current program completion data adjusted by the historical rate of the share indicating intent to seek employment
5	Current program completion data adjusted by indicated occupational preference of completer
6	Program completion data
7	Program enrollment data

*NOTE: Items ranked 3 and 4 may be considered preferred options for those who want to use current program data.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Data sources for entrants from education/training programs contain several different units of measure of available supply including enrollments, completions, and graduate status. How can these data be most appropriately used in supply/demand analysis?

SOLUTION: b. Identify the units of measure available from each source of data on education/training programs. Use the units of measure for each source that most closely approximates the concept of available supply even if it is not common to all sources.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the units of measure available from each source of data on education/training programs.	See Exhibit 4.4.4-2 and Data Source Coverage Table 4.4.4.
2. Identify the unit of measure from each source which best represents the concept of available supply.	See Exhibit 4.4.4-3.
3. Use the measure identified in Step 2 when including the data from each source in the supply/demand product.	Use of this procedure requires careful qualification and clear labeling of data.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 2. Combining data on entrants from different education/training programs may result in an overcount of supply because the individual could be counted by more than one agency. This duplication may occur between or among reporting systems which are individual-based (e.g., Rehabilitation MIS) or those that are institution/program-based (e.g., HEGIS). What methods can be used to identify and eliminate this duplication so that supply counts are not overstated?

SOLUTION: a. To eliminate duplication between individual-based reporting systems, compare the data from two sources at a time, match individual records to identify the nature of the overlap, and establish rules for counting each individual in only one source.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the sources which report data on entrants from education/training programs.	See Data Source Coverage Table 4.4.4
2. Label each data source as being institution-based or individual-based.	See Exhibit 4.4.4-1
3. For individual-based systems, compare data from two sources at a time to identify cases of overlapping count and situations where they occur.	
4. When cases of duplication between individual-based systems are found, determine what individual identification numbers are used by each reporting system.	Possible individual identification numbers include: . Social Security Number . Driver's License Number . Student Number

(Continued on Next Page)

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
5. For those reporting systems which use the same individual identification number, run data together to identify overlaps.	Privacy regulations concerning individual records may result in limited access to individual record identifiers. If they can be used, privacy and confidentiality must be guaranteed.
6. Establish rules and priorities for avoiding duplication in using the data for supply/demand analysis.	The assignment of program supply data to one reporting system rather than another may be a sensitive issue, especially if data are to be displayed and identified by training agency.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 2. Combining data on entrants from different education/training programs may result in an overcount of supply because the individual could be counted by more than one agency. This duplication may occur between or among reporting systems which are individual-based (e.g., Rehabilitation MIS) or those that are institution/program-based (e.g., HEGIS). What methods can be used to identify and eliminate this duplication so that supply counts are not overstated?

SOLUTION: b. To eliminate duplication between individual-based reporting systems and institution-based reporting systems, compare data from two sources at a time, identify the nature of the overlap and establish rules for avoiding duplication.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the sources which report data on entrants from education/training programs.	See Data Source Coverage Table 4.4.4.
2. Label each data source as being institution-based or individual-based.	See Exhibit 4.4.4-1.
3. Compare individual-based to institution-based reporting systems, two at a time to identify if there are any overlapping counts and the situations in which they occur.	
4. For situations with overlapping counts, establish rules and priorities avoiding duplication in using the data for supply/demand analysis.	It may be easier to exclude individual-based records rather than institution-based records to avoid problems in disaggregating institutional data.

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 2. Combining data on entrants from different education/training programs may result in an overcount of supply because the individual could be counted by more than one agency. This duplication may occur between or among reporting systems which are individual-based (e.g., Rehabilitation MIS) or those that are institution/program-based (e.g., HEGIS). What methods can be used to identify and eliminate this duplication so that supply counts are not overstated?

SOLUTION: c. To eliminate duplication between institution-based reporting systems, compare data from two sources at a time, identify the nature of the overlap, and establish rules for avoiding duplication.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify the sources which report data on entrants from education/training programs.	See Data Source Coverage Table 4.4.4.
2. Label each data source as being institution-based or individual-based.	See Exhibit 4.4.4-1.
3. For institution-based reporting systems, identify areas of possible duplication between systems.	See Exhibit 4.4.4-1 for possible overlapping reporting systems.
4. When cases of duplication are found, identify which programs are reported through more than one system.	Due to the use of different program classification schemes by different reporting systems, it may be difficult to match duplicated programs.
5. Establish rules and priorities for avoiding duplication in using the data for supply/demand analysis.	The assignment of program supply data to one reporting system rather than another may be a sensitive issue, especially if data are to be displayed and identified by training agency.

4.4.5 JOBSEEKERS

DATA SOURCE COVERAGE

There are four major sources of data on jobseekers:

- Employment Service (ES) job applicants
- Unemployment Insurance (UI) claimants
- Military discharges
- Current Population Survey (CPS)

These data sources can be used as a partial measure of occupational supply. The term "jobseekers", however, does not precisely correspond to the concept of occupational entrants but is used here to distinguish these sources of supply data from sources of entrants from education/training programs. While sources of data on jobseekers may be used as a proxy for new entrants and reentrants to the labor force, they are imperfect as a measure of that component because persons reported by these sources are usually already in the civilian labor force, with the major exception of military discharges. Most of the ES applicants, are unemployed and looking for jobs. Some may be new or re-entrants, and a few may be employed and looking for other jobs. All persons receiving military discharges are not necessarily ready to enter the civilian labor force, but may pursue further education or training. Some UI claimants may be on temporary layoffs and therefore have a specific job to which they may be recalled.

When data sources on jobseekers are used as a measure of labor force entrants or reentrants, gaps in coverage can also be a significant problem. There are many individuals seeking employment who are not reported under any one of these systems. Many persons seeking employment use resources other than the Employment Service, such as private employment agencies, help-wanted advertisements, information from friends or relatives, or application directly to chosen firms. Such individuals may in fact form the majority of labor force entrants and reentrants but are not currently counted under any established reporting system.

Duplication or double-counting among these sources of data is very likely, particularly because most UI claimants are required by State law to register with the ES as job applicants. Unemployed persons counted by the CPS will include UI claimants. Finally, persons discharged from the military might register with the ES or apply for UI benefits.

The full range of measurement issues arising from potential use of these four major sources of data on jobseekers is outlined in Data Source Coverage Table 4.4.5.

PROBLEM BACKGROUND

From the perspective of a planner or administrator of education/training programs, data on jobseekers is important because in some senses this group is the least visible subcomponent of supply to an occupation but is a factor to consider in a supply/demand interface. Jobseekers compete with entrants from education/training programs because they may already have the training and/or experience required to qualify for certain occupations. Some of the new entrants may be persons who participated in an education/training program at one time but did not immediately enter the labor force. Other new entrants might be persons who obtained skills in other ways, such as through volunteer experience or work performed in military service. For these reasons, the extent to which labor force entrants can be measured accurately through the use of data sources on jobseekers is of prime importance to the utility and completeness of supply/demand analysis and products.

While there are basically three problems regarding measurement of labor force entrants, only one of these, that of duplication, can be overcome by manipulating data from existing sources. The use of data on jobseekers as a measure of labor force entrants and the gaps in coverage of that universe are limitations of the existing data sources which were not established to perform those functions. The following statement outlines the problem of duplication, which does permit the application of procedural solutions.

	Page Number
PROBLEM: 1. Because of service overlaps between reporting systems that provide data on jobseekers, duplication of data may occur. How can this duplication be identified and eliminated so that supply counts will not be overstated?	
SOLUTION: a. Where possible, match individual identification numbers from overlapping data sources to identify duplication. Establish rules for counting each individual only once when using data on jobseekers in supply/demand analysis.	4.4-44

Volume 1 Sections-- 3.1.2
3.3.1
3.3.2

Measurement Issues

OIS Subcomponent--
Jobseekers

Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Unemployment Insurance (UI) System (3.1.2.A)	. UI data only provide data on the insured unemployed, not on all unemployed persons. . The UI data show only the previous occupational attachment of claimants. This previous attachment may not reflect the occupation(s) in which the individual is seeking work or for which the individual may be qualified.	. Depending upon State-specific UI laws, the insured unemployed will be required to register with the Employment Service. These individuals will, therefore, also appear as job applicants in Employment Service Automated Reporting System (ESARS) reports.	. UI claimants provide a partial measure of the level of current unemployment by occupation
Current Population Survey (CPS) (3.1.2.B)		. Since the Current Population Survey provides estimates of total unemployment, the insured unemployed from the UI system would be included in the CPS estimates. . The unemployment estimates from the CPS include all unemployed persons. The CPS estimates, therefore, will include those counted by the UI system. The unemployment information from the UI system, however, has more occupational detail than the corresponding information from the CPS.	. CPS Data provide a measure of the level of current unemployment by occupation although occupational detail is limited.

Volume 1 Sections--3.1.2
3.3.1
3.3.2

OIS Subcomponent -- Jobseekers

Programs/Data Sources	Measurement Issues: Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Employment Service Applicants (3.3.1.A)	. ES applicants represent a relatively small proportion of the jobseekers in a labor market.	. Unemployment Insurance (UI) laws usually require most UI claimants to register with the Employment Service. This results in a potential duplication of occupational supply counts between UI claimants and ES applicants. . Unemployed ES applicants would also be counted in the CPS estimates of unemployment. The ES applicant source of information, however, has more occupational detail than the corresponding information from the CPS. . Some ES applicants may have formerly been enrolled in and completed an education and training program. These ES applicants could be counted in a reporting system or survey program in that occupational supply subcomponent for a corresponding time period.	. ES applicants provide a partial measure of the number of individuals seeking work through various employment agencies. Because these applicants are registered with ES, this measure of occupational supply covers public sector agency registrants.

DATA SOURCE COVERAGE TABLE 4.4.5

Volume 1 Sections--3.1.2
3.3.1
3.3.2

OIS Subcomponent -- Jobseekers

Measurement Issues

Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Military Discharges (3.3.2.A)	. This source of information covers all individuals discharged or released from active duty from any of the five military services: - Army - Navy - Air Force - Marine Corps - Coast Guard	. Many recent military discharges either apply for UI benefits or become an ES applicant and hence may be reported in more than one reporting system. . Recent military discharges may also seek additional education or training services and thus be counted in one of the reporting systems or survey programs in that occupational supply subcomponent.	

PROCEDURAL STEPS FOR PROBLEM RESOLUTION

PROBLEM: 1. Because of service overlaps between reporting systems that provide data on jobseekers, duplication of data may occur. How can this duplication be identified and eliminated so that supply counts will not be overstated?

SOLUTION: a. Where possible, match individual identification numbers from overlapping data sources to identify duplication. Establish rules for counting each individual only once when using data on jobseekers in supply/demand analysis.

PROCEDURAL STEPS	COMMENTS/LIMITATIONS
1. Identify areas of possible duplication between different sources of data on jobseekers.	Possible individual identifiers include: . Social Security Number . Driver's License Number
2. Determine the individual identification number used by each data source.	
3. For those reporting systems which use the same individual identification number, the records can be matched to identify duplication.	Privacy regulations concerning individual records may result in limited access to individual record identifiers. If they can be used, privacy and confidentiality must be guaranteed.
4. Establish rules and priorities for avoiding duplication in using the data for supply/demand analysis.	

5. QUALITATIVE ANALYSIS— INTERPRETATION AND EXPLANATION

INTRODUCTION

Chapter 3 of this volume introduced an 11-step OIS Product Development Process. Chapter 4 described in detail the first seven steps in this process, ranging from identifying user needs to the development of quantitative supply/demand information for selected supply/demand products.

The occupational supply and demand information developed through step 8 has the following features:

- Common units of analysis
- Comparable geographic area coverage
- Comparable time period coverage
- No interpretation or analysis in either numerical or narrative forms
- Representative of a variety of programs and data sources
- Presentation limited to a tabular display of data

This chapter will describe two additional steps in this process, specifically:

- Step 9--Provide an initial explanation of what the quantitative supply/demand information means.
- Step 10--Analyze and interpret the quantitative supply/demand information through qualitative analysis.

It is necessary to recognize that the interpretation, analysis, and explanation of supply/demand information must be added to the presentation of data in tabular display; otherwise, inappropriate conclusions may be drawn from the quantitative data. The OIS product model introduced in Chapter 1 includes narrative, interpretation, and analysis as integral parts of the supply/demand product.

The purpose of this chapter is to discuss methods and techniques of interpreting and explaining occupational supply/demand data. The discussion is organized into the following sections:

- Initial explanation of the quantitative supply/demand information (Section 5.1)
- Occupational characteristics that identify the relevance of education and training programs to occupational entry (Section 5.2)
- Occupational characteristics that can be used to interpret or qualify the supply/demand relationships (Section 5.3)
- Proxy indicators of occupational supply/demand relationships (Section 5.4)

It should be noted that this chapter does not discuss all of the occupational characteristics described in Volume I of the OIS Handbook. Two types of characteristics information are not included here: those describing the nature of the occupation (definition and duties) and personal requirements (interests, temperaments, aptitudes, physical demands, and capabilities). The characteristics presented in this chapter are those that can be most directly used in supply/demand analysis.

The discussion of the occupational characteristics and proxy indicators in this chapter focuses on their use and application to interpret and analyze supply/demand relationships. It should be noted that the data sources for occupational characteristics and proxy information have limitations in coverage similar to occupational supply and demand data. The coverage of these sources are presented in tabular form in the last section of this chapter (Section 5.5).

5.1 INITIAL EXPLANATION OF THE QUANTITATIVE SUPPLY/DEMAND INFORMATION

The result of the OIS product development steps to this point is the production of one or more tables that display supply and demand data for a specified unit of analysis from different data/program sources. Given the difficulty in assessing a large amount of data at one time, it is helpful to convert the numbers to indices, ratios, or language that permit comparison and ranking of the data. The data comparison may be either within or between units of analysis. These two options are described below:

- Comparison of the supply/demand data within a given unit of analysis--This analysis involves comparing the relative size of the demand and supply numbers for the specified unit of analysis. This comparison may be described in words (e.g., balance, surplus) or the ratios of the supply/demand number. Several examples of intra-occupational comparison are listed below:

  - Example 1--Outlook description in the Occupational Outlook Handbook. For those occupations with information on the available supply of workers, the prospective supply/demand relationship is assessed and then translated into descriptions of "job opportunities" within each occupational narrative. The steps listed below describe the basis of comparison within an occupation.[1]

    (1) Compare occupational data on demand to supply (available training data)

    (2) Identify which of the following relationships is found in the first steps

      (a) Demand much greater than supply
      (b) Demand greater than supply
      (c) Rough balance between demand and supply
      (d) Likelihood of more supply than demand
      (e) Supply greater than demand

    (3) Describe the job opportunities for the occupation with one of the following statements:

      if 2a) Excellent
      if 2b) Very good
      if 2c) Good or favorable
      if 2d) May face competition
      if 2e) Keen competition

  - Example 2--The Oregon Employment Division publishes occupational employment trends that indicate if the occupational unit of analysis appears to be:

    .. Surplus--supply exceeds demand
    .. Shortage--demand exceeds supply
    .. Balance--supply near demand

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[1] Occupational Outlook Handbook, (U.S. Department of Labor, Bureau of Labor Statistics 1980), p. 5.

In describing the use of this information, the Oregon Employment Division provides this caveat:

> "All of the demand-supply conclusions reached in this publication are tentative given the limitations of the data and this should be used in conjunction with other information when trying to establish job related training programs."[2]

- Comparison of the supply/demand data across different units of analysis--This type of analysis involves assessing the relative size of the supply/demand number across different units of analysis (occupations, programs, or clusters). The analysis may focus on the data items within the demand component, supply component, or the supply/demand component. The comparison may be based on the relative size of either the individual data items or the ratio of data items. Several examples of interoccupational comparison are listed below:
  - Example 1--The Occupational Outlook Handbook's description of employment outlook for an occupation begins with a sentence about the expected change in employment through the 1980s. This description is based on a comparison of the occupation's projected change in employment requirements over the time period to the average increase projected for all occupations. The descriptions used relate to the following demand data:[3]

Description	Demand Data (Projected 1978-90 change in employment requirements)
Much faster than the average for all occupations	50.0 percent or more
Faster than the average for all occupations	25.0 to 49.9 percent
About as fast as the average for all occupations	15,0 to 24.9 percent

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[2] Occupational Employment Trends in the Portland Metropolitan Area, 1977-1985 (State of Oregon, Department of Human Resources, Employment Division 1979), p. 29.

[3] Occupational Outlook Handbook, Op Cit

Description	Demand Data (Projected 1978-90 change in employment requirements)
More slowly than the average for all occupations	5.0 to 14.9 percent
Little change is expected	4.9 to -4.9 percent
Expected to decline	-5.0 percent or more

- Example 2--Comparisons can be made across occupations or units of analysis. Descriptions of two such comparisons are presented below:
    - A number of States may publish data that display occupational titles in rank order by the relative size of their employment, annual job openings, or rate of growth.
    - States may publish a ranking of either the ratios of the supply/demand relationship or the "net difference" between supply and demand. State Plans for Vocational Education often have a net difference column in their supply/demand tables. A rank order listing of programs by this column may be helpful in explaining such a table.

5.2 OCCUPATIONAL CHARACTERISTICS--RELEVANCE OF EDUCATION/TRAINING PROGRAMS TO OCCUPATIONAL ENTRY

Section 5.1 described several methods to compare and describe the "hard" numbers produced by integrating occupational supply/demand data. This section considers some "soft" measures that can be used to interpret the supply/demand data. The measures used are based on several occupational characteristics.

Occupational characteristics are defined as job-related trait information about the worker and work performed in an occupation. As presented in Chapter 4 of Volume 1 of the OIS Handbook, there are eight major topics and 26 specific items included in occupational characteristics. Several of these occupational characteristics are used in this section to identify the relevance of training programs to occupational entry. It should be noted that this discussion of the individual characteristics treats them as independent measures, even though some characteristics, such as wages or job stability, may fluctuate with changes in the occupational supply and demand relationships. The characteristics are described as they independently affect supply/demand relationships.

The occupational characteristics that identify the relevance of training programs to occupational entry are listed below, with a notation of the Volume 2 sub-section in which they are described and the Volume 1 section that identifies major data sources.

Section	Characteristic	Volume 1 Description	Volume 2 Page Numbers
5.2.1	Degree of Unionization	4.8.5	5-6
5.2.2	Occupational Demographics	4.8.1	5-7
5.2.3	Entry Level Positions (Methods of Entry)	4.6.2	5-7
5.2.4	Industrial Concentration	4.8.4	5-7
5.2.5	Licensing Certification and Registration Requirements	4.5	5-8
5.2.6	Education and Training Requirements (SVP/GED)	4.4	5-8

These six characteristics are described below. The importance of these factors is to help qualify the supply/demand relationships. Specifically, these factors may provide qualitative evidence about the appropriateness and relevance of education and training programs for entering particular occupations. These characteristics should be understood and considered by planners prior to analyzing occupational supply/demand data.

5.2.1 DEGREE OF UNIONIZATION

This characteristic is significant as it affects entry into an occupation. The degree of unionization in some occupations may affect the number of persons entering the occupation as well as the means of entering it. Union-sponsored apprenticeship programs may provide the only source of workers who can be hired for an occupation in a certain locale or industry. If this is the case, the supply/demand is most pertinent to the education and training facilities which are engaged in apprenticeship programs, The requirement and procedures for entering occupations that are highly unionized should be known and considered in the presentation of supply/demand data for program planning purposes.

5.2.2 OCCUPATIONAL DEMOGRAPHICS

Data on the known race, sex, and age distribution of the workers employed in an occupation can be of value in program planning. Occupations that historically have had sex and race employment patterns may have nontraditional employment potential. The age distribution of the workers currently employed in an occupation, when compared with the distribution of the labor force, may indicate the level of experience of workers currently working in the occupation or which is required for entry.

5.2.3 ENTRY-LEVEL POSITIONS (METHODS OF ENTRY)

Entry-level positions are those jobs most often open to workers beginning in the occupation. They may be at the lowest or beginning level of a promotional line, or they may be in "dead-end" jobs where turnover is apt to be high. Most entry-level jobs are filled from outside the employing establishment and therefore present good potential for placements from training programs, where pre-entry training is necessary or helpful. Sources that can help indicate entry-level occupatons include Employment Service job orders (See Volume 1, Section 2.1.2) and the occupational placements of education and training program graduates (See Volume 1, Section 3.2.2).

5.2.4 INDUSTRIAL CONCENTRATION

Knowledge of the employment concentration of an occupation by industry is of value in supply/demand analysis. When an occupation is concentrated in a few industries, it may be possible to obtain information on occupational entry routes by making surveys of the hiring methods of firms in the industry. A major source for identifying the industrial concentration of occupational employment is the inverted Industry-Occupation Matrix described in Section 2,1.1 of Volume 1.

5.2.5 LICENSING, CERTIFICATION, AND REGISTRATION REQUIREMENTS

Most State or local laws require that the individual must obtain a license from a State agency in order to engage in certain specified occupations, professions, or trades. The individual is required to meet all of the following specifications:

- Graduation from an accredited or approved education/training program, or completion of a given amount of work experience in the specific job
- Acceptable performance on a qualifying examination
- Certain personal prerequisites, such as age, citizenship, and good moral character

The importance of each of these specifications is described below:

- Licensing standards provide specific and exact statements of education/training and/or work experience requirements of an occupation. If an OIS product is prepared for occupations related to a short-term or secondary vocational training program, licensed occupations requiring completion of a postsecondary program probably should not be included.
- Qualifying examinations affect the measurement of available supply. The number of persons passing the exam may be a better measure of occupational supply than the number of graduates from related programs.
- Age or other requirements may suggest appropriate training areas for programs serving specific populations.

See Volume 1, Section 4.5 for a description of information sources on licensing requirements.

5.2.6 EDUCATION AND TRAINING REQUIREMENTS (SVP/GED)

Education and training requirements are a significant factor in matching supply and demand information, Occupations that require completion of a two-year training program should not be matched with the graduates of short-term programs. For licensed occupations, the entry level may be determined by a legal standard. For other occupations, the Specific Vocational Preparation (SVP) designation used in the DOT Master Data Set (See Volume 1, Section 4.9.1.E) provides a useful rating of training requirements.

The SVP includes the amount of time required to learn the techniques, acquire the information, and develop the capability needed for average performance in a specific job situation. SVP includes vocational education, apprenticeship training, in-plant training, on-the-job training, and essential experience in other jobs. The SVP rating scale follows:

LEVEL	TIME	Approximate Clock Hours
1	Short demonstration only	
2	Anything beyond short demonstration up to and including 30 days	-160
3.	More than 30 days up to and including three months	160-480
4	More than three months up to and including six month	480-960
5	More than six months up to and including one year	960-1920
6	More than one year up to and including two years	1920-3840
7	More than two years up to and including four years	3840-7680
8	More than four years up to and including 10 years	7680-19200
9	More than 10 years	19200+

The General Education Development (GED) is a companion rating to the SVP. It rates education of a general nature, not specific occupational preparation. The GED rating scale (6 = Highest, 1 = Lowest) is used in three divisions: reasoning development, mathematical development, and language development. See Volume 1, Section 4.4 for a more complete discussion of SVP and GED.

5.3 OCCUPATIONAL CHARACTERISTICS THAT CAN BE USED TO INTERPRET OR QUALIFY THE SUPPLY/DEMAND RELATIONSHIP

In this section four occupational characteristics are described. These characteristics can be measured independently of the supply/demand relationship. These can be used as separate measures to test, either reinforcing or countering, the outlook for occupational training based on supply/demand analysis. The characteristics are listed below with a reference to the Volume 1 section that presents the major data sources for each characteristic.

Section	Characteristic	Volume 1 Description	Volume 2 Page Numbers
5.3.1	Job Stability	4.8.2	5-10
5.3.2	Turnover/New Hires	4.8.3	5-11
5.3.3	National, State and Local Earnings	4.7.2	5-12
5.3.4	Working Conditions--Physical Environment	4.2.2	5-13

5.3.1 JOB STABILITY

Job stability in occupations may be affected by seasonal fluctuation (variations during the year) or by cyclical fluctuation (variations over a business cycle). Measurement of job stability is generally accomplished through research studies using economic models that analyze occupational employment trends over time. Job stability is best described using a relative scale. In general, the more stable the occupation, the more attractive it is for training programs. Listed below are three representative statements outlining different relative degrees of cyclical and seasonal job stability:

Relative Degree of Job Stability

- Cyclincal stability based on relative employment and unemployment during a business cycle
    - Highly stable--Employment in an occupation is relatively stable under both good and bad business conditions

  - Moderately stable--Employment in an occupation fluctuates moderately under varying business conditions

  - Unstable--Employment in an occupation fluctuates significantly under varying business conditions

- Seasonal stability based on realtive employment levels over the course of the year

  - Highly stable--Employment in an occupation is relatively stable over the course of the year

  - Moderately stable--Employment in an occupation fluctuates moderately over the course of the year

  - Unstable--Employment in an occupation fluctuates significantly over the course of the year

5.3.2 TURNOVER/NEW HIRES

The turnover of labor within an industry probably produces many of the job openings available in an occupation. Turnover does not represent growth and replacement in the occupation, but rather the openings created by the normal dynamics of hiring, termination, transfers, layoffs, quits, and promotions. In a quantitative supply/demand analysis, based upon long-term demand projections, an occupation may show little or no growth or replacement demand, yet there may be many job orders and referrals resulting in hires at Employment Service offices. The measure of the amount of turnover in an occupation or industry may be very important in the supply/demand analysis of many vocational education and CETA programs. There will be cases where the supply of trained workers from vocational education and CETA programs will exceed the projected demand for the occupation, yet follow-up data on related placement and unemployment rates in that occupation will not indicate excess supply. In these cases, the labor turnover for the occupation and its predominant industries should be analyzed to better interpret the supply/demand relationship. A high turnover rate would indicate that the long-term demand figures do not fully represent the dynamic demand for that occupation. A certain amount of turnover can indicate a greater number of employment opportunities than indicated by projections of growth and replacement needs. A turnover rate may also be excessively high indicating that there may be factors which make the occupation undesirable and thus not well-suited as an employment goal for a program participant seeking economic stability.

The primary sources of labor turnover information is the publications of the Labor Turnover Statistics (LTS) program. It should be noted that these data are available by industry only. The survey generates monthly rates of accessions/separations per 100 employed in manufacturing, mining, and communications. The statistics provide State-wide and some SMSA coverage.

The LTS data are published in the following documents:

- Employment and Earnings (monthly)
- LMI Newsletter (monthly)
- Labor Turnover in Manufacturing (monthly press release)
- Employment and Earnings, United States (annually)

Below the SMSA level, some States may have the Employer Information System or the Employment Service Potential System, which could provide very specific data on labor turnover by employer, including Standard Industrial Classification (SIC) code, at a sub-State level (ZIP Code or local ES office).

5.3.3 NATIONAL, STATE, AND LOCAL EARNINGS

Wages are a key factor in education and training program planning. A major focus of the training is to improve the economic condition of program participants. Wage information can be used to help qualify supply/demand relationships in several ways. High wages in occupations with current job vacancies may indicate good training potential or they may reflect limitations to and constraints on occupational entry that may limit the role of training programs. Generally, high wages positively affect the supply of workers available for work in an occupation and low wages have a negative impact.

The importance given to wage data in interpreting supply/demand data may vary by agency. Agencies that operate programs to increase client earnings potential or conduct training in areas with the greatest social benefits vis-a-vis program costs (i.e., benefit/cost ratios) may place a greater emphasis on wage data than agencies emphasizing immediate job placement. Wage and earnings data sources are described in Volume 1, Section 4.1.2.

5.3.4 WORKING CONDITIONS--PHYSICAL ENVIRONMENT

The physical environment of a job includes possible exposure to heat, cold, wet, noise, or various hazards, or atmospheric conditions. The existence of any of these factors may reduce the attractiveness of an occupation for individual entry or training program development. The DOT Master Data Set (See description in Section 4,2 of Volume 1) provides working condition ratings for more than 12,000 DOT occupational titles.

The specific working conditions rated include:

- Physical Working Environment
  - Inside--Worker spends 75 percent or more of time indoors
  - Outside--Worker spends 75 percent of time, or more, outside
  - Both--Inside and outside (in approximately equal amounts)
- Extreme cold with or without temperature changes
- Extreme heat with or without temperature changes
- Wet and/or humid
- Noise and/or vibration
- Hazards
  - Mechanical
  - Electrical
  - Burns
  - Explosives
  - Radiant energy
  - Toxic agents
  - Working in high places
- Atmospheric conditions
  - Fumes
  - Odors
  - Dusts
  - Mists
  - Gases
  - Poor ventilation

5.4 PROXY INDICATORS OF THE OCCUPATIONAL SUPPLY/DEMAND RELATIONSHIP

The quantitative analysis described in Section 5.1 is based on the relative size of the numbers available to measure supply and demand. The purpose of this section is to describe several factors that can be used as proxy indicators of the supply/demand relationship. It should be noted that proxy indicators should be used with some caution as the coverage of their data sources is often more limited than that of the major sources of supply and demand data (See Section 5.5). The proxies described are listed below.

To the right of each factor is the section in Volume 1 that provides a description of major data sources for that factor:

Section	Proxy	Volume 1 Description	Volume 2 Page Numbers
5.4.1	Historical Placement Data	3.2.2	5-15
5.4.2	Ratio of the Number of Job Orders to the Number of Applicants Over Time	2.1.2.A and 3.3.1.A	5-16
5.4.3	Hard-to-Fill Openings	2.1.2.A	5-17
5.4.4	Emerging Occupations	2.2.1	5-18
5.4.5	Industry Growth Patterns	2.2.1.A	5-19
5.4.6	Employment Service Potential and Employer Information System	5.2.3.B	5-20

These proxy factors, if based on adequate and valid data, can be used in the following ways:

- In the absence of other supply/demand data, proxies can be used as indicators of a supply/demand relationship and become part of the data base used in program planning and career counseling.
- In conjunction with supply/demand data, they can be used to verify, either reinforcing or contradicting, the supply/demand relationship.

- In conjunction with supply/demand data, they can be used to indicate relationships at a finer level than available supply/demand data:
    - Example One--Proxy data may be available for smaller geographic areas. They might be used to estimate local patterns given the area relationship set by supply/demand data.
    - Example Two--Proxy data may be available for finer levels of occupational detail than supply/demand data. It could be used to estimate the pattern of individual occupations within the context of a broader occupational supply/demand relationship.

5.4.1 HISTORICAL PLACEMENT DATA

Historical data on placements by occupation reported by education and training institutions or by the Employment Service provide a useful indicator of past supply/demand situations. Placement rates can be analyzed across occupational or instructional areas. Placement rates across occupational areas can be compared and ranked to identify the top/bottom five or ten areas for further analysis.

This process is similar to the quantitative analysis described in Section 5.1, except placement rates, not supply/demand data, provide the information base. Placement rates provide an immediate measure of job-related outcomes of training programs. The following limitations should be recognized in using placement data:

- Several different measures of placement may be available. Training-related job placement provides the most direct proxy for supply/demand relationships. Depending on the training program, job placement and educational placement data may also be available.
- Placement rates may be good proxies of supply/demand relationships as they represent multiple year and multiple agency data. Single-source, single-year placement data are usually of limited value because outcomes may be based on isolated economic conditions or unique guidance, training, or job placement features of the training agency.

The following relationships may be inferred from the placement rates of different education/training programs:

Relative Measure	Indicated Supply/Demand Relationship
High placement rate in occupation (by program and/or by training establishment)	. There is a high occupational demand for those job skills in the labor market and/or . There is a shortage of workers already trained or qualified for the occupations and/or . The completers of the program are superior in skill to other applicants and/or . Employers are actively recruiting program graduates
Medium placement rate	. Demand for workers is continuous but not strong and the total supply of available workers from all sources is adequate to meet ongoing needs
Low placement rate	. There may be insufficient jobs available in the labor market and/or . The program completers are not successfully competing for the available openings

5.4.2 RATIO OF THE NUMBER OF JOB ORDERS TO THE NUMBER OF JOB APPLICANTS OVER TIME

Trend data developed from counts of the number of job orders received and the number of applicants seeking work in an occupation over a given period of time may serve as a useful proxy for the supply/demand conditions in a given occupation in a labor market. Trend information may be developed over time from data available in the Employment Service Automated Reporting System (ESARS) reports. ESARS Table 96, Applicants and Nonagricultural Job Openings by Occupation, is a routinely published report that is, in effect, a mini-report on occupational supply/demand that reflects the transactions of the State Employment Service. In the absence of more complete data, Table 96 can be used on a longitudinal basis to determine general directions in the labor market; it also can be used to determine the volume of hiring, wages offered, and industries actively engaged in hiring in some occupations. The primary users of this information are CETA, WIN, Job Service, Vocational Rehabilitation, and Vocational Education planners and placement counselors who are dealing with occupations which are similar in part to the occupations reported by the Employment Service.

Trends found in the relationship of the number of job orders to the number of job applicants over time may parallel the actions of the total labor market and may, therefore, have considerable merit as a proxy for supply/demand analysis. However, users of this proxy should consider the following:

- In some rural areas the Employment Service may have relatively high penetration into the local labor market and job order/job applicant information for these areas could be representative of the total labor market. Employment Service penetration may be relatively low in urban areas and the information is not as representative of the general labor market.

An increasing number of applicants to the number of job orders may indicate a general labor market-wide excess supply in that occupation. If the number of applicants to the number of job orders remains relatively constant, this may indicate a long-term stability in the occupation. An increasing trend of more job orders being received than applicants registering for work in an occupation may indicate a general labor market shortage of trained workers

The State of Oregon, Department of Human Resources, Employment Division has initiated Project FOCUS, which tracks job orders and applicants by occupation over time.

5.4.3 HARD-TO-FILL JOB OPENINGS

One of the available Employment Service statistics on "hard-to-fill" openings is a ratio of openings unfilled 30 days or more to total openings available during the period. ESARS Table 96, Applicants and Nonagricultural Job Openings by Occupation, lists openings by occupation that have been on hand with the Employment Service for 30 days or more and are still open at the end of the reporting period.

When the ratio is high (25 percent of total are still unfilled at the end of the period), the occupation may have unpleasant working conditions, offer low pay and low status; or there is an insufficient supply of workers to fill the available jobs. When the ratio is low, the occupation may be desirable or there may be a sufficient supply of qualified workers

Users of this proxy in supply/demand analysis should be careful to recognize that many of the openings reported in ESARS Table 96 may be for low-pay, low status jobs, or for jobs listed by employers only to comply with Federal regulations. Some employers may continually list openings in high turnover occupations in excess of their needs in order to get a constant flow of job applicants.

5.4.4 EMERGING OCCUPATIONS

Emerging occupations are those occupations that are relatively new in an industry or in the occupational structure in general, and are appearing in sufficient number to be considered significant in the labor market. Potential indicators of emerging occupations include:

- A significant increase in employment in an occupation between two OES Surveys
- An employer listing an occupation on an OES Survey that had not been previously listed
- Technical publications from the Bureau of Labor Statistics, such as the Occupational Outlook Quarterly, that discuss an emerging occupation

By definition, an emerging occupation will have short-term demand that exceeds supply. Planning training programs to meet anticipated demand in an emerging occupation may prove difficult because of the lack of experience with the skills, structure, and scope of the occupation within industries.

5.4.5 INDUSTRY GROWTH PATTERNS

Much of the employment information collected nationally uses an industry classification structure, usually the Standard Industrial Classification (SIC). As a result, a great deal of information is known about the growth and/or decline of specific industries. Federal, State, and local commerce and economic growth agencies and industry associations analyze in detail the growth patterns of industry. Publications from these agencies may provide indicators of which industries may be expanding or contracting in a given area. As a proxy for supply/demand analysis, the industry-occupation matrix from the OES program (or industry staffing patterns, where available) could be applied to these industries to provide an indicator of which occupations are likely to be especially affected. Occupations whose employment is concentrated in a few industries may warrant special attention (See Section 5.2.4).

Expanding industries are likely to produce jobs for which there may be insufficient supply in the labor market. However, it should be noted that industries that require extensive capital investment to expand are likely to have considered the availability of skilled workers before committing to the capital investment.

Industries that are contracting in size may generate the most difficult occupational supply/demand relationships in a local labor market. Reduced occupational demand may result in a rise in unemployment in these occupations employed in that industry. Situations where rapid industrial contraction occurs may result in students participating in training programs for which there is little opportunity for employment upon graduation.

Industry growth patterns provide a useful proxy for supply/demand analysis for occupations found in industries undergoing particularly rapid growth or contraction, as the long-term demand projections will not adequately reflect these short-term fluctuations in the local supply/demand situation.

5.4.6 EMPLOYMENT SERVICE POTENTIAL AND EMPLOYER INFORMATION SYSTEM

The Employment Service Potential (ESP) and Employment Information System (EIS) are programs that serve to measure the Employment Service penetration of job placement in a labor market. Since only a few State Employment Security Agencies have implemented an ESP or EIS program, their use as a proxy is very limited. Also confidentiality factors in those States producing ESP/EIS information may limit their use outside the agency.

Although there are differences between ESP and EIS, those differences do not affect this discussion. ESP/EIS provides information on the total number of hiring actions taking place within the State for which the Employment Service may have a reasonable opportunity of obtaining a job order from the employer and to which the Employment Service would refer the successful job applicant. ESP/EIS exclude hires in which the Employment Service is precluded from participating, such as those made through union hiring halls, government entities, rehires, or other restricted placements.

The ESP and EIS programs are intended to assist the Employment Service in increasing its success as an intermediary in job placement services. In effect, they provide a potential placement target for the Employment Service (See the discussion of historical placement rates as a proxy for supply/demand analysis in Section 5.4.1). ESP and EIS program data may provide trends in labor turnover and hiring rates by industry, geographic areas, and, in some instances where allowed by law, company name, but not occupations.

5.5 COVERAGE OF DATA SOURCES USED FOR THE INTERPRETATION ANALYSIS, AND EXPLANATION OF SUPPLY/DEMAND INFORMATION

This chapter has described the application of selected occupational characteristics and proxy indicators to the interpretation, analysis, and explanation of the supply/demand relationship. The data sources of these characteristics and proxy indicators have limitations in coverage similar to the sources of occupational supply and demand data.

This section presents four separate data source coverage tables for the major sources in two categories, labor turnover data, and occupational characteristics information. The four tables list coverage dimensions for the same issues discussed in Chapter 4 (classification, geographic, etc.). The sources are listed down the left-hand side of the table with a dot (●) placed next to each source in the column(s) indicating the applicable coverage dimensions. Relevant comments and qualifiers are listed on the right-hand side of the table. The four tables for labor turnover data are first, followed by those for sources of occupational characteristics information.

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Classification Systems

Programs/Data Sources	OES Survey	OES Survey-Based Matrix	1970 Census	Census-Based Matrix	DOT 3rd Edition	DOT 4th Edition	SOC	1972 SIC (as updated in 1978)	1967 SIC	HEGIS	USOE (Handbook VI)	Military Occupations	Other	Comments
Labor Turnover Statistics Program (5.2.3 A)								●						. No occupational detail is associated with this program.
Employment Service Potential Program (5.2.3.B)								●						. No occupational detail is associated with this program.

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Programs/Data Sources	National	Census Region	Federal Region	State	SMSA or Labor Market Area	County	Planning District	Prime Sponsor Area	ES Local Office	LEA/School District	City	Zip Code	Institution	Other	Comments
Labor Turnover Statistics Program (5.2.3.A)	●		●	●											. This survey program routinely generates turnover information for the nation, the States, and certain metropolitan areas. Some States collect sufficient data to permit calculation of accession or separation rates for various sub-State areas.
Employment Service Potential Program (5.2.3.B)					●	●	●		●						. Information can be generated for local ES offices, counties, SMSAs, or a State

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Time Periods

Programs/Data Sources	Projection (point in time)	Projection Period (average annual)	Calendar Year (annual average)	Federal Fiscal Year	Other Fiscal Year	School Year	Biennially	Annually	Semi-Annual	Quarterly	Monthly	Weekly	Daily (or continuously)	Other	Comments
Labor Turnover Statistics Program (5.2.3.A)			●1								●1,2				1. The Labor Turnover Statistics Survey is conducted monthly. 2. Monthly Turnover rates are generally published within two to three months after data collection. 3. Average annual turnover rates are published regularly in Employment and Earnings.
Employment Service Potential Program (5.2.3.B)										●	●				. The ESP program relies on the comparison of successive Unemployment Insurance Wage Reports (which may be submitted either monthly or quarterly).

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Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Labor Turnover Statistics Program (5.2.3.A)	. This survey program provides monthly accession and separation rates for manufacturing, mining, and communications industries.		. This is the only survey program conducted on an ongoing basis that is specifically intended to collect labor turnover information.
Employment Service Potential Program (5.2.3.B)	. This research program provides estimates of hiring data by industry and local geographic area. These estimates are developed through detailed comparisons of successive Unemployment Insurance wage reports filed by employers. These estimates can only be developed in States requiring wage reports that list individual employees.		. This is basically a research program to support the operations of the Employment Service.

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Programs/Data Sources	OES Survey	OES Survey-Based Matrix	1970 Census	Census-Based Matrix	DOT 3rd Edition	DOT 4th Edition	SOC	1972 SIC (as updated in 1978)	1967 SIC	HEGIS	USOE (Handbook VI)	Military Occupations	Other	Comments
Bureau of Labor Statistics Wage Surveys (4.9.1.A)													●	. The occupational categories used in these surveys do not relate directly to any existing occupational classification system.
Census of Population (4.9.1.B)			●						●					. The 1970 Census used the 1970 *Classified Index of Industries and Occupations* for occupational and industrial classification. The industrial classifications were based on the 1967 SIC with adaptations.
Current Population Survey (4.9.1.C)			●						●					. Data are collected using all Census occupational categories although data on employment and unemployment are presented for only 12 major Census occupational groups. . Data are collected using 1970 Census industrial classifications which were based on the 1967 SIC with adaptations.
Dictionary of Occupational Titles (4.9.1.D)						●								

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Programs/Data Sources	OES Survey	OES Survey-Based Matrix	1970 Census	Census-Based Matrix	DOT 3rd Edition	DOT 4th Edition	SOC	1972 SIC (as updated in 1978)	1967 SIC	HEGIS	USOE (Handbook VI)	Military Occupations	Other	Comments
DOT Master Data Set (4.9.1.E)						●								
Directory of National Unions and Employee Associations (4.9.1.F)														. The occupational categories reported in the surveys used for compiling this directory do not necessarily relate to any existing occupational classification system.
Guide for Occupational Exploration (4.9.1.G)						●								
Health Careers Guidebook (4.9.1.H)						●								
Military-Civilian Occupational Source Book (4.9.1.I)						●					●	●		. Job description statements for military service occupations are clustered using USOE program titles, DOT codes and titles, and related military occupations.
Occupations Regulated by States (4.9.1.J)							●							. The occupations included in the forthcoming ETA monograph have a SOC code indicated for each occupation.
Wage Surveys (4.9.1.K)														. The occupational classification system used for wage surveys varies by the source of the survey.

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Classification Systems

Programs/Data Sources	OES Survey	OES Survey-Based Matrix	1970 Census	Census-Based Matrix	DOT 3rd Edition	DOT 4th Edition	SOC	1972 SIC (as updated in 1978)	1967 SIC	HEGIS	USOE (Handbook VI)	Military Occupations	Other	Comments
Career Information Delivery Systems (4.9.2.A)						●	●							. The DOT is the most commonly used classification system for the characteristics basis of the structured search accessing strategy. . NOICC policy indicates that the CIDS programs funded by NOICC should use the SOC as the primary classification system within which occupational titles and descriptions will be presented.
Exploring Careers (4.9.2.B)						●								
Career Guides and Vital Information on Education and Work (VIEW) Programs (4.9.2.C)						●								. The DOT is the most commonly used classification structure for these materials and programs although a variety of classification systems may be used.
Occupational Outlook Handbook, 1980-1981 (4.9.2.D)			○			●								. The occupations covered in the Occupational Outlook Handbook directly reference selected 4th Edition DOT codes. . Employment outlook for the occupations covered is derived from the Census-based matrix.

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Programs/Data Sources	National	Census Region	Federal Region	State	SMSA or Labor Market Area	County	Planning District	Prime Sponsor Area	ES Local Office	LEA/School District	City	Zip Code	Institution	Other	Comments
Bureau of Labor Statistics Wage Surveys (4.9.1.A)															
. Industry Wage Surveys	●		●		●										. Information is collected from individual establishments and is published for many metropolitan areas as well as regional and national summaries, except for the area wage surveys.
. Area Wage Surveys					●										
. National Survey of Professional, Administrative, Technical, and Clerical Pay	●		●		●										
. Municipal Government Wage Surveys	●		●		●										
. Union Wage Rates	●		●		●										
Census of Population (4.9.1.B)	●	●	●	●	●										. Special tabulations of Census data can also be generated upon request for counties, cities, Census tracts, blocks, or other defined areas.
Current Population Survey (4.9.1.C)	●	●	●	●	●										. Data are available for all States and metropolitan areas. Not all statistics are available for all metropolitan areas.
Dictionary of Occupational Titles (4.9.1.D)	●														
DOT Master Data Set (4.9.1.E)	●														

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Programs/Data Sources	National	Census Region	Federal Region	State	SMSA or Labor Market Area	County	Planning District	Prime Sponsor Area	ES Local Office	LEA/School District	City	Zip Code	Institution	Other	Comments
Directory of National Unions and Employee Associations (4.9.1.F)	●			●											. This publication provides information for national unions and professional and State employee associations.
Guide for Occupational Exploration (4.9.1.G)	●														
Health Careers Guidebook (4.9.1.H)	●														
Military-Civilian Occupational Source Book (4.9.1.I)	●														
Occupations Regulated by States (4.9.1.J)				●											
Wage Surveys (4.9.1.K)														●	. The geographic coverage is defined by the individual survey.
Career Information Delivery Systems (4.9.2.A)	●			●											
Exploring Careers (4.9.2.B)	●														
Career Guides and Vital Information on Education and Work (VIEW) Programs (4.9.2.C)	●			●											
Occupational Outlook Handbook, 1980-81 (4.9.2.D)	●														

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Programs/Data Sources	Projection (point in time)	Projection Period (average annual)	Calendar Year (annual average)	Federal Fiscal Year	Other Fiscal Year	School Year	Biennially	Annually	Semi-Annual	Quarterly	Monthly	Weekly	Daily (or continuously)	Other	Comments
Bureau of Labor Statistics Wage Surveys (4.9.1.A)															
. Industry Wage Surveys														●	. Fifty manufacturing and twenty non-manufacturing industries are surveyed on either a three-year or five-year cycle.
. Area Wage Surveys								●							. 70 SMSAs are surveyed on an annual basis.
. National Survey of Professional, Administrative, Technical, and Clerical Pay			●[2]					●[1]			●[2]				1. This survey is conducted annually. 2. Monthly and annual average salaries are reported for the occupations surveyed.
. Municipal Government Wage Surveys								●							. All cities with a population of 500,000 or more are surveyed annually.
. Union Wage Rates							●	●							. Surveys of different unions are conducted either annually or biennially.
Census of Population (4.9.1.B)														●	. The Census is conducted every ten years with information becoming available within three years of actual Census-taking activities.
Current Population Survey (4.9.1.C)			●[2]								●[1,2]				1. CPS information is collected monthly. 2. Monthly and annual average statistics are published by BLS.

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Programs/Data Sources	Projection (point in time)	Projection Period (average annual)	Calendar Year (annual average)	Federal Fiscal Year	Other Fiscal Year	School Year	Biennially	Annually	Semi-Annual	Quarterly	Monthly	Weekly	Daily (or continuously)	Other	Comments
Dictionary of Occupational Titles (DOT) (4.9.1.D)														●	. The DOT is revised periodically. The 4th Edition was published in 1977.
DOT Master Data Set (4.9.1.E)														●	. The DOT Master Data Set is revised in conjunction with the DOT. The revision corresponding to the 4th Edition of the DOT was available in 1977.
Directory of National Unions and Employee Associations (4.9.1.F)			●2				●1								1. The survey to collect the information for this publication is collected biennially. 2. Information in this publication reflects 1977 data. The publication was released in December, 1979.
Guide for Occupational Exploration (4.9.1.G)														●	. This publication was released in 1979 and is based in part on the 4th Edition DOT.
Health Careers Guidebook (4.9.1.H)														●	. This publication was released in 1979.
Military-Civilian Occupational Source Book (4.9.1.I)														●	. This publication was released in 1978.
Occupations Regulated by States (4.9.1.J)														●	. Publication of occupational regulation information by States varies with the individual State.

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Programs/Data Sources	Projection (point in time)	Projection Period (average annual)	Calendar Year (annual average)	Federal Fiscal Year	Other Fiscal Year	School Year	Biennially	Annually	Semi-Annual	Quarterly	Monthly	Weekly	Daily (or continuously)	Other	Comments
Occupations Regulated by States (4.9.1.J) (continued															. A monograph prepared by ETA, entitled Occupational Regulation in the States is scheduled for publication in late 1980.
Wage Surveys (4.9.1.K)														●	. The frequency and time period coverage of these surveys varies by the source of the survey.
Career Information Delivery Systems (4.9.2.A)								●					●		. Information in CIDS programs is either updated continuously or on an annual schedule.
Exploring Careers (4.9.2.B)														●	. This publication was released in 1979.
Career Guides and Vital Information on Education and Work (VIEW) Programs (4.9.2.C)														●	. These materials are updated on schedules that vary by State.
Occupational Outlook Handbook (4.9.2.D)		●[2]	●[3]				●[1]								1.The OOH is updated and published every two years. 2.The employment outlook information is based on the national Census-based I-O matrix covering 1978-90. 3.Wage information is based on 1978 wage surveys.

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Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Bureau of Labor Statistics (BLS) Wage Surveys (4.9.1.A)			
. Industry wage surveys	. This survey program covers approximately 50 manufacturing and 20 non-manufacturing industries accounting for more than 22 million employees.	. Wage surveys by professional or employee associations and unions probably partially overlap in coverage with the BLS system.	
. Area wage surveys	. These surveys provide wage data on 76 occupational categories common to a variety of industries in 70 SMSAs.		
. National Survey of Professional, Administrative, Technical, and Clerical Pay	. Survey of salaries in selected occupations in private industry. Industry divisions surveyed include: - Mining - Construction - Manufacturing - Transportation - Communications		

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Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
. National Survey of Professional, Administrative, Technical, and Clerical Pay (continued)	- Electric, gas, and sanitary services - Wholesale trade - Retail trade - Finance, insurance, and real estate - Selected services	. Wage surveys by professional or employee associations and unions probably partially overlap in coverage with the BLS survey.	
. Municipal Government Wage Surveys	. These surveys provide information on occupational earnings, work practices, and supplementary benefits for employees of municipal government in cities with a population of 500,000 or more.		
. Union wage rates	. These surveys provide information on minimum wage rates and maximum schedules of hours as provided in labor-management agreements for specified crafts and jobs in selected cities. Surveys cover five industries:		

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Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
. Union wage rates (continued)	- Building trades - Printing - Local transit - Local truck drivers and helpers - Grocery stores	. Wage surveys by professional or employee associations and unions probably partially overlap in coverage with the BLS surveys.	
Census of Population (4.9.1.B)			
Current Population Survey (4.9.1.C)			. The CPS occupational demographics and characteristics information updates the information collected by the Census.
Dictionary of Occupational Titles (DOT) (4.9.1.D)	. The DOT provides a wide range of occupational characteristics for more than 12,000 occupational fields.		

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Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
DOT Master Data Set (4.9.1.E)	. This is a computer tape that contains coded profiles and definitions of more than 12,000 DOT occupations.		
Directory of National Unions and Employee Associations (4.9.1.F)	. This directory is based on a BLS survey of unions and employee associations. Information is provided pertaining to the membership of these organizations.		
Guide for Occupational Exploration (4.9.1.G)	. This publication organizes occupations into 12 interest areas, 66 work groups, and 348 subgroups.	. Information in this publication is based on the occupational characteristics of the DOT.	
Health Careers Guidebook (4.9.1.H)	. This publication provides information on health careers.		
Military-Civilian Occupational Source Book (4.9.1.I)	. The Source Book describes clusters of common military specialty occupations as well as occupational areas that are unique to one or more of the military services.		

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Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Occupations Regulated by States (4.9.1.J)	. These publications, both State and federal, cover occupations for which there are licensing, certification, or registration requirements.		
Wage Surveys (4.9.1.K)	. The coverage of these surveys will vary with the individual survey.	. These surveys will probably partially overlap in coverage with BLS surveys.	
Career Information Delivery Systems (4.9.2.A)	. These systems integrate information from a variety of sources to deliver career information through computer terminals.	. Information included in these systems are actually provided by other sources of occupational information.	
Exploring Careers (4.9.2.B)	. This publication is targeted for middle school/junior high school audiences and focuses on workers at their jobs. Information in this publication is presented by career clusters rather than detailed occupations.		
Career Guides and Vital Information on Education and Work (VIEW) Programs (4.9.2.C)	. These programs provide career information in printed and microfiche versions.		

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Programs/Data Sources	Extent of or Gaps in Coverage	Duplication of Coverage	Other Comments
Occupational Outlook Handbook, 1980-1981	. This publication is a major source of education guidance information for approximately 300 occupations and 35 industries.	. Information included in this publication is provided by numerous other sources of occupational information.	